SOUTHERN Flight

Including MODERN AIRPORTS

March, 1945
25 cents

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MAR 20 1945

Corsairs on the Carriers

Long recognized as the Navy's fastest airplane, Vought Corsair fighters are daily being flown into combat from the decks of American and British aircraft carriers.

"Ruggedness, speed, firepower and range combine to make the Corsair more than a match for anything the enemy can offer."

CHANCE VOUGHT AIRCRAFT
STRATFORD, CONNECTICUT
ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION

"M"

STANDS FOR VICTORY...TOO

"That may sound like a trick remark to you folks on the home front, but I'm a lad who ought to know, so just let me 'shoot the breeze' a bit, and you'll see what I mean.

"Back around the turn of the year, I'm chauffeur of a Glory Wagon flying Purple Heart Corner on a milk run that isn't helping the Axis Supply Lines any. With forty-one successful missions over this same area . . . I gues we kind of overlooked that swell cover the pea-shoot boys had been giving us . . . Then all Hell broke loo around our ears. . . . . .

"For next time over, a weird looking bunch of band blitzed through us, and dished out such a mauling th the guys who got back sounded as wacky as the ta of the farmer who saw his first giraffe and yelpe 'There ain't no sich animal'. . . . . .

"So we learned about jet-propelled Jerries the hard wa and the beatings we took the next few trips did litt but swell the flak-happy circle . . . for nothing we ha seemed to be the answer. . . . . .

"But sooner than we'd any right to hope for, we found out, . . . and so did Mr. Goering's smug thugs . . . Flying top cover on our next mission came an escort of new THUNDERBOLT M's* that A-2 had been so hush-hush about . . . They looked just like any other 47's to my jaundiced eye . . . and probably to the eager beavers from Berlin. . . . . .

"We were both wrong . . . but this was their turn to take it, and no foolin'. . . . . .

"My geese were just lining out for their run, when down came the 'jets' again . . . but what a kick we got when right on the tail of these super-doopers streaked those THUNDERBOLT M's . . . diving three feet for every two of the startled Heinies. . . . . .

"Well, THUNDERBOLT fire power is no secret . . . and with this amazing increase in speed, it was just too bad for those new toys of the 'Supermen' . . . The 'jets' that were left, kept right on going and they haven't troubled us too much since . . . The Luftwaffe had thrown its Sunday punch . . . and found out again . . . that we had a wallop to more than match it."

*** THE PERFORMANCE OF THE THUNDERBOLT "M" AND ITS PILOTS HAS ESTABLISHED NEW STANDARDS OF PROTECTION.**

REPUBLIC AVIATION

CORPORATION

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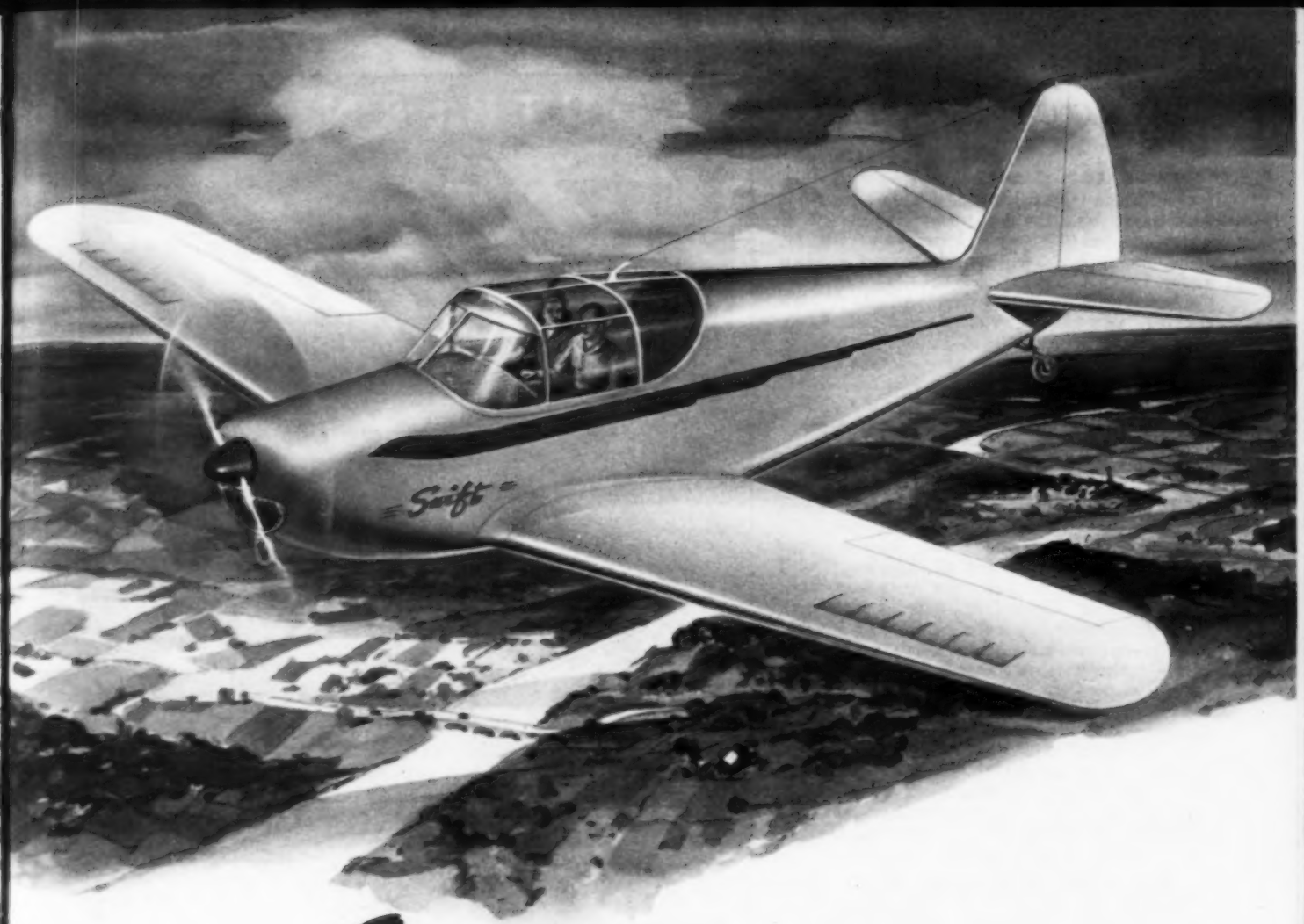
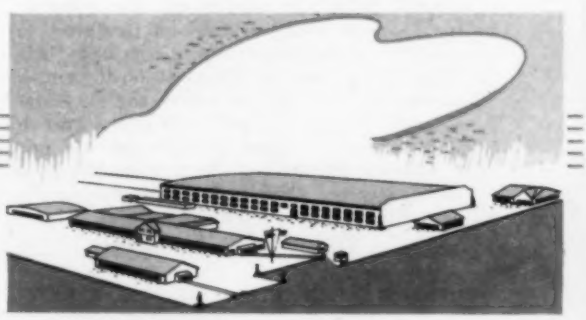


6 big-plane features in your safe, low-cost personal plane . . .

Here is a plane you'll be proud to own . . . that's sporting to fly . . . and a plane you can afford. It's the new *Swift*, combining into a safe, easy-to-fly personal plane these *six* big-plane features: 1. Bubble-type canopy giving wide vision . . . 2. Extra sturdy, retractable landing gear . . . 3. N. A. C. A. design wing slots . . . 4. Flaps for safe, slow landings . . . 5. Roomy, de luxe cabin . . . 6. Advanced aerodynamic design, with plenty of thrifty power. In addition, the new *Swift* offers you long range and speed for cross country flying . . . and it can soon be yours to enjoy . . . at less cost than you'd expect. The new *Swift* will be moderately priced in volume production and ready for delivery soon after conditions permit the manufacture of personal airplanes.

The Swift

Made by GLOBE AIRCRAFT CORPORATION Fort Worth, Texas



Y AVAILABLE

Revving Up

NEW CARGO GIANTS: Still the world's largest plane (Convair's Model 37 is bigger but isn't flying yet), the Army's old Douglas B-19 which pointed the way toward super bomber development, has been converted into a cargo plane for AAF experiments. Now powered by four 2,600-hp. liquid-cooled Allison V-3420 engines, and redesignated as XB-19A, it is expected to handle payloads of more than 45,000 pounds. With the new engines it also received reversible-pitch propellers. . . . First pictures and details of the 160-ton Consolidated Vultee Model 37, powered by six pusher engines of a new type, can be found on page 28 of this issue. It has a 230-ft. wing and 182-ft. fuselage as compared with the XB-19A's 212-ft. wing and 132-ft. fuselage. . . . So much progress is being made in air transport design and operations, "complete armies, with their heaviest artillery and all equipment" will be moved by air to fight the next war, says Vice President Richard Boutelle of Fairchild. The big problem, as he sees it, will involve close co-operation between aircraft and ordnance designers. Aircraftsmen have always been governed by weight and dimensions of the equipment to be hauled, but ordnance designers haven't always kept aircraft limitations in mind. The new C-82, for example, was just right for the standard 155-mm howitzer—until bigger howitzer tires, belatedly suggested for use in loose sand, made the gun two inches or so too wide to fit in the C-82.

★ ★ ★

CAB EXAMINER RESIGNS: C. Edward Leasure has resigned as chief examiner for the Civil Aeronautics Board to enter private law practice in Washington, D. C., with Robert G. Thach. Francis W. Brown, an associate of Leasure for the past fifteen years, and assistant chief examiner, has been promoted to the post of chief examiner.

★ ★ ★

WHAT FOREMEN WANT TO KNOW: The National Foremen's Institute recently polled 50,000 foremen in American industry and found that most foremen seem to feel that relations between foremen and top management are very poor at the present time and should be improved so that foremen will be anxious to develop a more management-conscious attitude. Fifty-four per cent of the foremen give top importance to the improvement of employe co-operation, leadership, efficiency, supervisory and discipline-maintaining methods, and handling grievances. Only 3 per cent thought that handling of women employes was of "A-1" importance. Forty-one per cent placed human relations in the foreman's job as more important than his role as a work organizer or production expert.

★ ★ ★

NEW AVIATION JOURNAL: Air Affairs, Inc., a non-profit corporation planning to publish a quarterly journal named "Air Affairs", is now in the process of organization in Washington under the sponsorship of well known leaders in every branch of aviation. Neither a trade journal nor a popular magazine, the new publication will foster the study and discussion of the impact of aviation upon everyday life.

(Continued on page 24)

SOUTHERN
Flight
Including MODERN AIRPORTS

Twelfth Year of Progress with Aviation

MARCH, 1945 VOL. XXIII, NO. 3

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worth waiting for NEWS

No. 1 - UTILITY

THE FIRST OF A SERIES OF INFORMATIVE ADVERTISEMENTS ABOUT THE NEW CULVER.
PUBLISHED BY THE CULVER AIRCRAFT CORPORATION, WICHITA 1, KANSAS

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UTILITY WILL BE EMPHASIZED IN CULVER'S POSTWAR MODEL

THERE is no longer any doubt about the usefulness of an airplane. It has many utilities: getting to out-of-the-way places by direct air route, often saving many miles of travel; using a free air path with small, inexpensive fields rather than costly highways or railroads; saving hours or even days of traveling giving more time for business and pleasure.

This is the utility of any airplane. We believe, however, the real utility of aircraft after the war will be to get you where you are going *more economically, faster,* and *safer* than by any other mode of transportation. On this basis the New Culver will possess an exceptionally high degree of utility.

The new Culver will be economical because in the light plane field it offers more performance, more miles traveled, at the same cost of operation as other airplanes of comparable horsepower. Culver engineers have dedicated themselves to designing, and the Culver organization has constantly worked to efficiently build a ship that offers maximum cross-country performance with a minimum of power. The result is fast transportation at low cost.

The new Culver will be fast, for it will have clean external lines. It will be the logical development, aerodynamically and structurally, of a series of airplanes of which the old original commercial Culver is several models back.

The new Culver will be safe because it has been designed with safety in mind, as will be evidenced by the use of the tricycle gear, soundly engineered construction, unobstructed vision, and specific improvements which can only come from the experience of having designed several new Army and Navy models and having built hundreds, yes thousands, of airplanes in this war period.

So, if you want an airplane with real utility, you'll wait for the New Culver, the new low-wing monoplane, wood constructed, tricycle retractable geared Culver – that cross-country airplane designed specifically for utility – that new Culver which is definitely WORTH WAITING FOR.

FROM OUR MAILBAG

Our mail indicates a growing trend toward the Culver design and Culver's conception of utility. Here are extracts from just three of the thousands of letters received:

"Economical"

I personally plan on buying a Culver after the war because it is an economical plane, both in purchasing and operating – still having a swell cruising speed and performance. – J.C.A.

"Ideal Commercial Ship"

The Culver is the ship we've been most interested in. Not to mention the fact that it rates about the highest with our pals also, as the ideal commercial ship for all around flying. – S.A.M.

"Culver for the Average Man"

I have flown most light airplanes before I was in the service, and my choice has been Culver for the average man. I like a fast airplane and at the same time an economical one. And the old prewar Culver certainly lives up to both. Well since my career as a Navy pilot I have been in Multi-engine exclusively. But you can be sure after the war I'll remain a Culver enthusiast. – O.L.L.

For Further Information Write to Culver Aircraft Corp., Dept. SFa, Wichita 1, Kansas

JUST AMONG OURSELVES

Editorials and Comment

DANGEROUS ECONOMY

THE Bureau of the Budget is knifing aviation in the heart by insisting on the reduction of CAA airports' service personnel. The extent of this reduction is revealed in the order to the CAA Fourth Region to cut from the present complement of thirty specialists to eighteen by the end of March. By June 30, the Budget says, the Fourth Region will have to get along with only ten field men in the airport division. Apply the same figures over the nation and it isn't difficult to see how the immediate dissipation of technically trained career men will seriously threaten the success and effectiveness of any national airport program that might be passed by Congress. We shudder at the thought of a national program administered by politically appointed incompetents who certainly will take the place of the old-timers who came up the hard way in airport science and upon whom will rest the major share of responsibility in future airport development.

The CAA airport advisory service personnel now in the process of decimation simply can not be replaced. Mostly engineers, these men are tried and true. Once released from service, the government will never get them back. Instead of reducing their number, competent new men should be added and schooled by the veterans in anticipation of an accelerated national airport program.

At this writing there are at least six Federal Aid Airport Bills pending in Congress and all of them provide for an immediate appropriation of three million dollars to the CAA for perfecting the National Airport Plan. Present demands on the airport advisory service far exceeds the ability of the CAA to provide immediate assistance with its current personnel allotment. A cut at this time is little short of folly.

Only Congress can over-ride the all powerful Budget Bureau. March 31 is just around the corner. Unless the people in aviation bring this issue squarely before Congress and fight for the retention of these sorely needed airport experts, any national airport program can be expected to end up in chaos. The hope for a brilliant future of aviation development in the United States places the responsibility on all of us and we simply can't afford to permit the Budget Bureau to gamble with hard-to-replace technical aviation resources.

☆ ☆ ☆

THE NON-SCHEDULED HEARINGS

THE non-scheduled civil aviation hearings before Civil Aeronautics Board examiners in Washington March 27 might not receive the national attention and publicity enjoyed by the CAB "feeder line" hearings but will be just as significant to the future course of aviation in this nation and in the long run actually more important to more of our people. While non-scheduled civil aviation is an active, going phase of our industry the "feeders" are figments of wishful thinkers and the long-range planners. Outside the possible establishment of a few more experimental short-haul scheduled operations, feeder airline operations are more likely to remain where they are now—on paper.

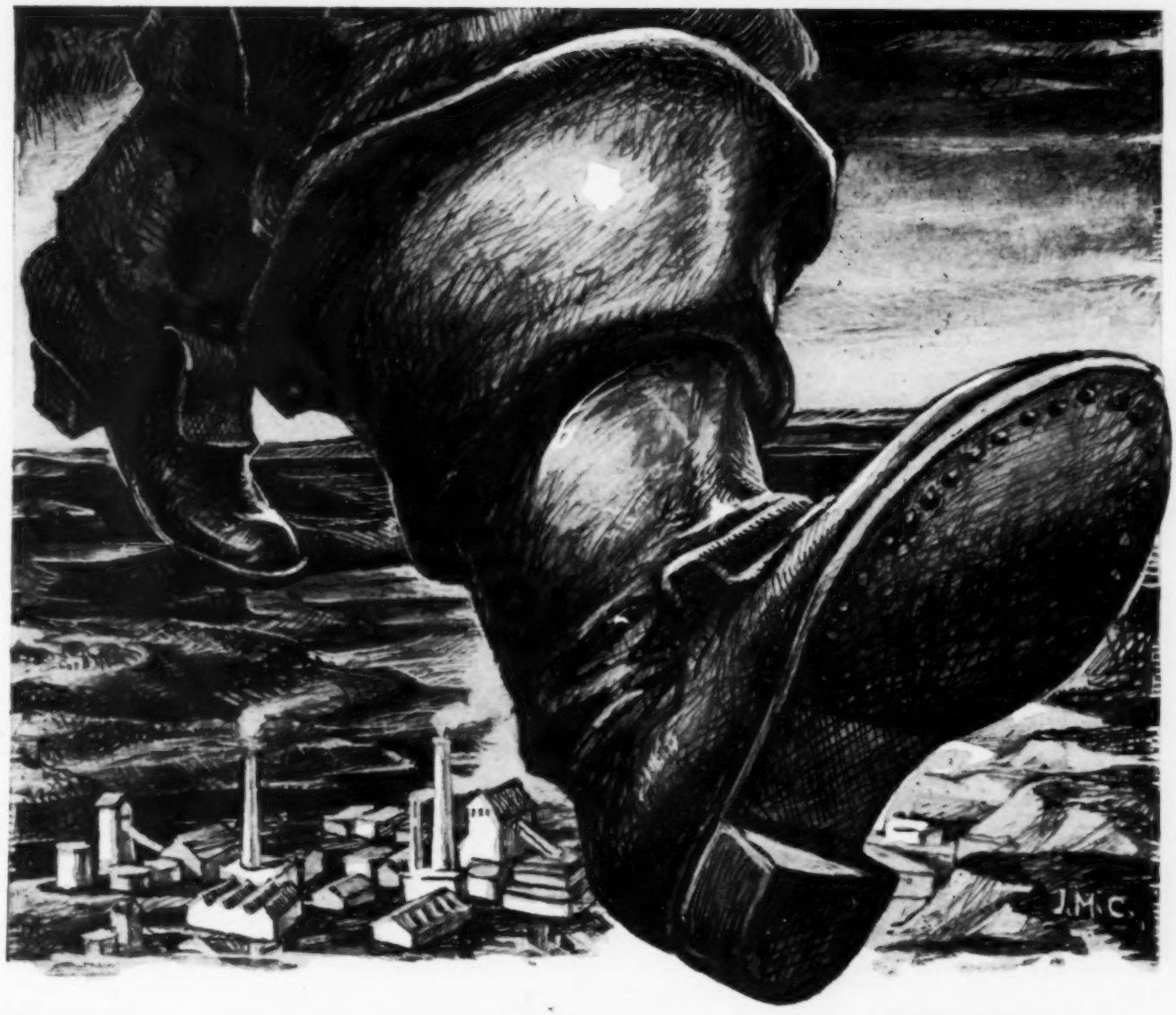
It will be disastrous to civil aviation if the non-scheduled interests ignore the Washington hearings. It is not convenient for the average operator to leave his enterprise for the long trek to Washington but so much is at stake, every non-scheduled operator who can afford a trip at this time should make every effort to be present March 27. Out of these investigations will come recommendations for future Federal policy which promise to affect the livelihood of every airport service operator in the nation, large or small, new or old.

As matters stand now, the National Aviation Trades Association, the only organization representing the non-scheduled operator, plans to appear before the examiners and urge that such activities as sales and service, flight instruction, repair and overhaul, aerial advertising and photography, agricultural flying such as crop dusting, etc., be left alone and remain exempt from additional regulation, especially economic regulation. With reference to taxi, charter, contract or short hop, intra-state, semi-scheduled flying activities, NATA says this is not the time to talk about economic regulation. Welcome, however, will be a full discussion of safety regulations so that the public will be protected from irresponsible, fly-by-night opportunists. Also welcome will be a complete discussion of revised regulations that would differentiate between day contact flying, night contact flying, all weather (instrument) flying and the kind of equipment that should be required for each classification of travel. NATA holds that intelligent safety regulations of taxi, charter and contract flying activities will protect the operator as well as the public.

The subject of contract operations, in which goods only—not passengers or mail—are carried, opens up an entirely new field for speculation, pointing to the time when regulations will be established governing the contract carrier. The day will come when transport type aircraft will be plentiful in the surplus market. So we can anticipate the time when operators other than the air transport companies will buy up some of these transports and engage in contract hauling. A large number of non-scheduled operators would like to see the matter argued out now in hopes that they will be exempt forever from economic control.

It should be recognized that there are very few profitable charter operations even now when emergency travel conditions force a lot of people to pay premium prices to fly from one place to another. Operating costs of an efficient, safe and dependable charter service are terrific. Charter prices are high to the man who pays them but far too low in the eyes of the operator who discovers at the end of each month what a small margin of profit he enjoys. Whereas additional safety regulations governing his operations might be acceptable to the reputable charter service operator, he knows full well that economic regulations by the CAB at this time are out of the question and would represent a costly burden to him and to the government agency also.

The foregoing touches on just a few of the subjects due for a good airing at the CAB hearings this month. Other matters of similar importance and significance will come up for study and



Putting 7 League Boots on an Airplane...

Extra Range—Extra miles per pound of fuel and engine weight—that's diesel power! The new, light-weight, higher horsepower, radial air-cooled Guiberson Diesel is coming. And with it will come longer range, lower operating cost and greater safety in aircraft power plants.

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discussion but these few should provide an index to the knotty problems that must be solved if a now small but potentially great phase of aviation is to find its place in the aviation sun and provide a rich new source of employment and national wealth in the days ahead. Surely here is one instance where the Federal agency must remember it was created by Congress to foster and encourage the development of aviation.

☆ ☆ ☆

PUBLIC OPINION AND AIR POWER

POSTWAR planning for air power has advanced considerably in recent months, and the American public is confidently expecting adequate preparedness in the air. It's a little confusing, to be sure, what with jet propulsion, directed rockets, radar, super explosives and the like giving impressions of push-button air power. But whatever shape or form will develop, our armed forces, our aircraft industry and an impressive array of Congressional influence are taking definite steps to insure unprecedented air preparedness.

There is one point however, on which we believe planning has been inadequate and on which it will be easy to stumble. We refer to public relations in general and specialized military aviation writing in particular. Despite elaborate military publicity operations during World War II, U. S. air power has been handicapped by public unawareness and misunderstanding. It is true that some of the smartest publicity men in the country have performed an outstanding service for air power. But publicity alone has not been and never will be adequate for the task.

Air power's chief handicap has been the lack of thorough public relations planning and handling prior to the war. Where General H. H. Arnold now directs a staff of outstanding writers and experts, the prewar Air Corps looked on public relations as of secondary importance, or less. Staff officers handled this all-important job in addition to other duties, muddling along as best they could without allowing the development of public opinion to interfere with their peacetime routine. Came the war, and it took reams of misinformation and strenuous efforts of aviation writers, AAF authorities, broadcasters and artists to put across to both the public and officialdom an understanding of strategic air warfare. Heavy bombers were secondary in priority ratings, which impeded their construction and supplies. Influential persons doubted the effectiveness of precision bombing, and self-styled "experts" demanded our big bombers be used only at night.

The importance of informed writing goes beyond mere space-filling. The press, as well as the military, should recognize an important obligation in furthering the maintenance and advancement of U. S. air power. We can be sure of sea power's bid for public opinion, but what can we expect in behalf of aviation? Let no one insubordinate air power in the future, either intentionally or through ignorance of the facts, for it has become the most potent force the world has ever known. Aggressors of tomorrow won't allow the United States time to overcome its weakness in the air. Next time we will be the primary target, not some European or Asiatic city or port or naval installation.

Public unawareness and false security can be readily overcome by informed aviation writing. Aroused by events during this war — we're still fighting with a ten-year-old B-17 design — and determined to support aviation in the future, the public looks to the press for accurate, fair and thorough presentation of air power's position. But the press can not serve air power on conjecture alone, as it has done too often and too voluminously in the past. Topside military aviation planning should consider public opinion as a major resource in the development of air power, and aggressively go about the task of telling the people the full story. Staff duties should emphasize, rather than ignore or minimize, public relations. Writers who have dedicated their work and careers to military aviation should be encouraged and assisted in every way possible in their specialization. Air power's need of capable spokesmen will become increasingly great.

Public opinion, too often overlooked in the laboratory, the training field and the inner sanctums of the high command, is vital and essential to air power. With its support aviation can grow to a fullness guaranteeing American defense from aggression. Without it our military aviation establishment stands to be stunted and handicapped, and the future of the nation and civilization everywhere jeopardized.

☆ ☆ ☆

OPPORTUNITY FOR PROFITS

SIMPLIFICATION of Civil Air Regulations, particularly those sections that apply to the private flier, should become a reality within the next sixty or ninety days. After fourteen months of thorough study, careful analysis and constant revision, the Safety Bureau delivered last month's final recommendation to the CAB for simplification of Part 20, 43 and 60. We confidently predict that all non-scheduled flying interests will profit immeasurably by these revisions.

When the administrator finally announces the changes, we see a healthy opportunity for individuals and companies engaged in flight instruction, sales and service to attract thousands of new prospects to their airports for flying courses. For example, the required written work for a private pilot's examination has been vastly simplified. Questions will cover operating and air traffic rules and a few broad questions on safety practices. In addition, the administrator is preparing a small book which will contain all of the information a hopeful pilot needs to know in order to pass the test.

Although many people who can afford to fly and own airplanes won't admit it, the CAA written examinations and the time required for preparation have been a bug-a-boo to them. Business men frankly don't have the time to learn about adiabatic lapse rates and involved theoretical navigational problems they will never use. As a result only about 15 per cent of prewar personal type airplanes were sold to people who didn't derive income out of aviation.

If we are going to fulfill the optimistic predictions of the experts who claim an unprecedented boom in personal flying after the war, one of the necessary elements will be simplification of regulations governing the private flier. Then we might hope to sell more airplanes to people who can afford them rather than to the old marginal market wherein the final result was early abandonment of airplane ownership.

The simplified and revised regulations should be publicized as widely as possible not only by the administrator's office but by all private flying interests, and especially by the fixed-base operators who can uncover an entirely new source of revenue at a time when they sorely need substantial profits to tide them over the remaining war years. ★ ★ ★

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about this new Glidair

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Never before such a *complete* range of colors!

Never before such easy-to-follow directions for obtaining any shade desired!

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And there are sound reasons for its popularity. For example, it presents 24 Glidair standard colors plus 32 inter-mixed colors . . . a range so wide it *more than meets* ordinary industry requirements! It offers such simple directions anybody can quickly and accurately obtain any of the 32 inter-mixes or the innumerable combinations they offer.

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★ ★ ★

There is a Glidair finish for every aircraft need. Each shipment of Glidair Fabricote Fabric Rejuvenator, Clear Nitrate Dope, Pigmented Dopes, Primers for Metal Surfaces and Heat Resisting Engine Finishes is laboratory-tested on government panels. And the superior covering quality of Glidair finishes makes for lower cost—as much as *50% lower at the gun!* Specify Glidair for your next paint job.

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THE W. B. MATTHEWS CO....Municipal Airport, San Antonio, Texas

GLIDAIR FLYING COLORS

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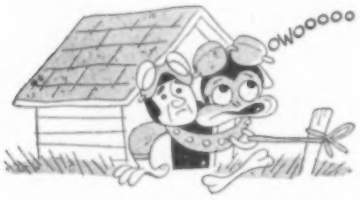
The Birdmen's Perch

By *Major Al Williams,* ALIAS, "TATTERED WING TIPS"
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.

You'll have to admit one thing!
When we make a mistake, it's a dandy! 66% of the December Perch was wrong!

We were so full of good wishes that we used most of the Perch to bid Merry Christmas to everyone. That left room for only 3 Little Known Facts. 2 of them were wrong. And we're so deep in the doghouse we bark at the mailman.



Private Eugene M. Przybyla:

Your Little Known Fact about the P-47 originally having an in-line engine, was so startling that we assumed it *had* to be true. Then we talked to the fellas out at Farmingdale who build the P-47! The P-47 was designed as a radial job, built that way, and wouldn't know an in-line engine if it met one on a streetcar!

So would you look up your mechanic friend who gave you this hot tip . . . and give him a kick in the teeth?

John E. Scovill:

Your Little Known Fact about a P-38 J carrying more bomb load than a "Fort" started more "Lynch Al Williams Clubs" than Przybyla's! It *could* be true, mind you. But only with unalike factors for the two planes, such as distance, the amount of stripping necessary, etc.

We humbly apologize to the Fort builders for this inaccuracy. And now, will they please recall the B-17's they've had over Pittsburgh the last month? Honest, fellas—our office is way down in the basement and you might hurt a lot of nice people upstairs if you let those bombs go!

As for Perch Pilots Przybyla and Scovill . . . we won't revoke your commissions, but we sure as heck are going to suspend 'em! We'll reinstate you upon receipt of another Little Known Fact *which you can prove!*

And from now on, send Little Known Facts About Well Known Planes *with proof.* Remembering we verify them again, anyhow!

HEATED HEAT AND REFINED REFINING

Here's the Army—and a cold engine.

The Army says "we want that engine to start!" So they design a heater to heat the cold engine so it'll turn over. But the *heater* gets cold, too. And *it* won't turn over!

So the Army designs a heater to heat the heater which heats the engine which turns over! And that's that!

Now here's Gulf—and some crude oil.

Gulf says "we want that oil refined!" So they design a refining technique to purify the oil so it'll lubricate. But the *lubricant* they get isn't as pure as they think it should be!

So Gulf designs an additional technique to refine the refined oil! That's the Alchlor Process, which gets out *extra* impurities left in the oil by ordinary refining methods.

And out comes Gulfpride, the lubricatingest lubricant that ever pampered a piston! Better try it, if you haven't.

LITTLE KNOWN FACTS DEPT.

(The following Little Known Fact About Well Known Planes came from an Air Corps Major who knows what he's talking about. But he asked us not to use his name. No difference—he sure rates a commission as a Perch Pilot (br) for this:)

"The span of a B-29 is 19 feet shorter than half the span of another plane currently under construction!"

And here's one from Jack Evans of 3918 Terrace, Kansas City, Mo. (for the luvva Pete, if you disagree, write to *him*—not us!)

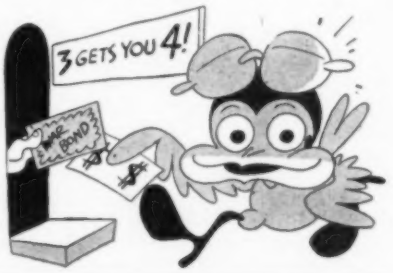
"The old DO-X made a flight carrying 169 passengers, largest number ever carried on one flight by one plane. Date: Oct., 31, 1929!"

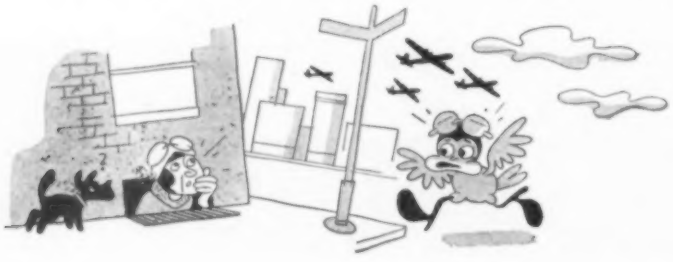
Kathleen Kennedy of 2 Presidio Ter., San Francisco 18, Cal., is a Perch Pilot with:

"At an altitude of 3000 feet, the most popular putt-putt has a gliding range of 20,000 acres!"

That makes three new Perch Pilots. If you want one of these commissions, send your Little Known Fact to us—*with proof*—and if it's good enough to print you'll be welcomed into the exalted ranks of Perch Pilots.

Just one more item—the war costs $250,000,000 a day! You've got to buy a lot of War Bonds to keep up with that!





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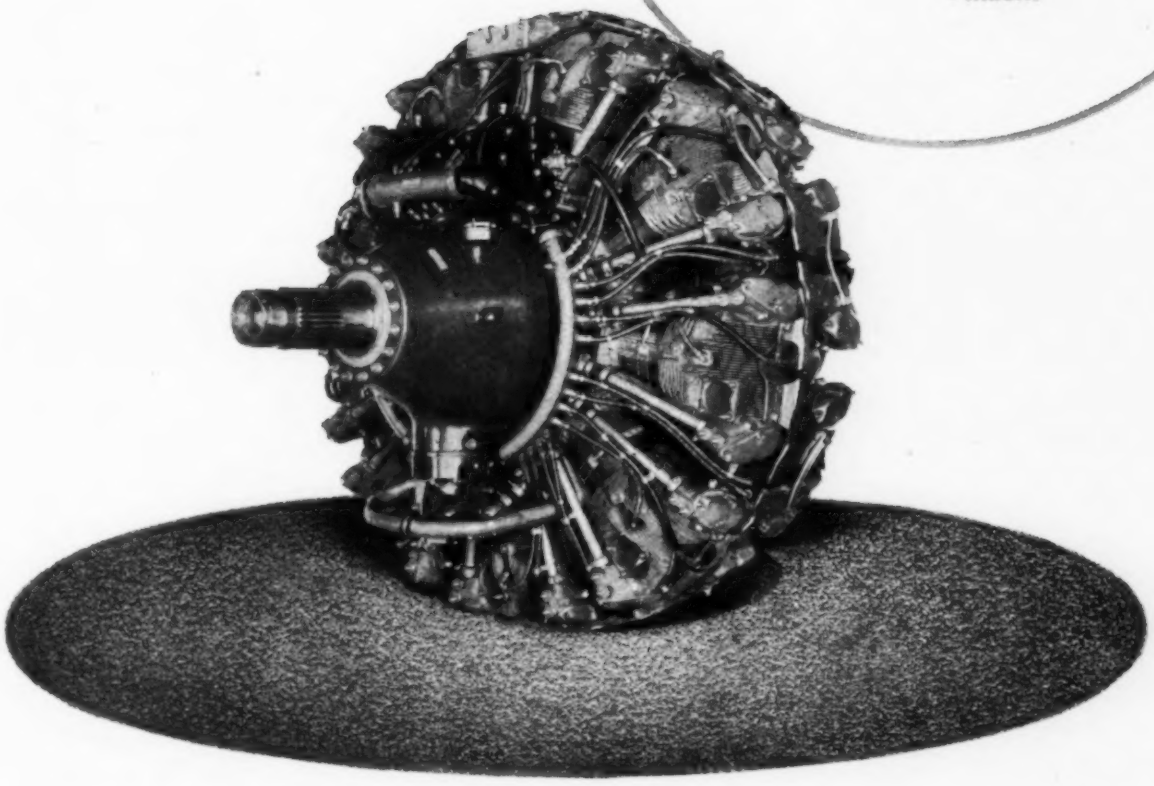

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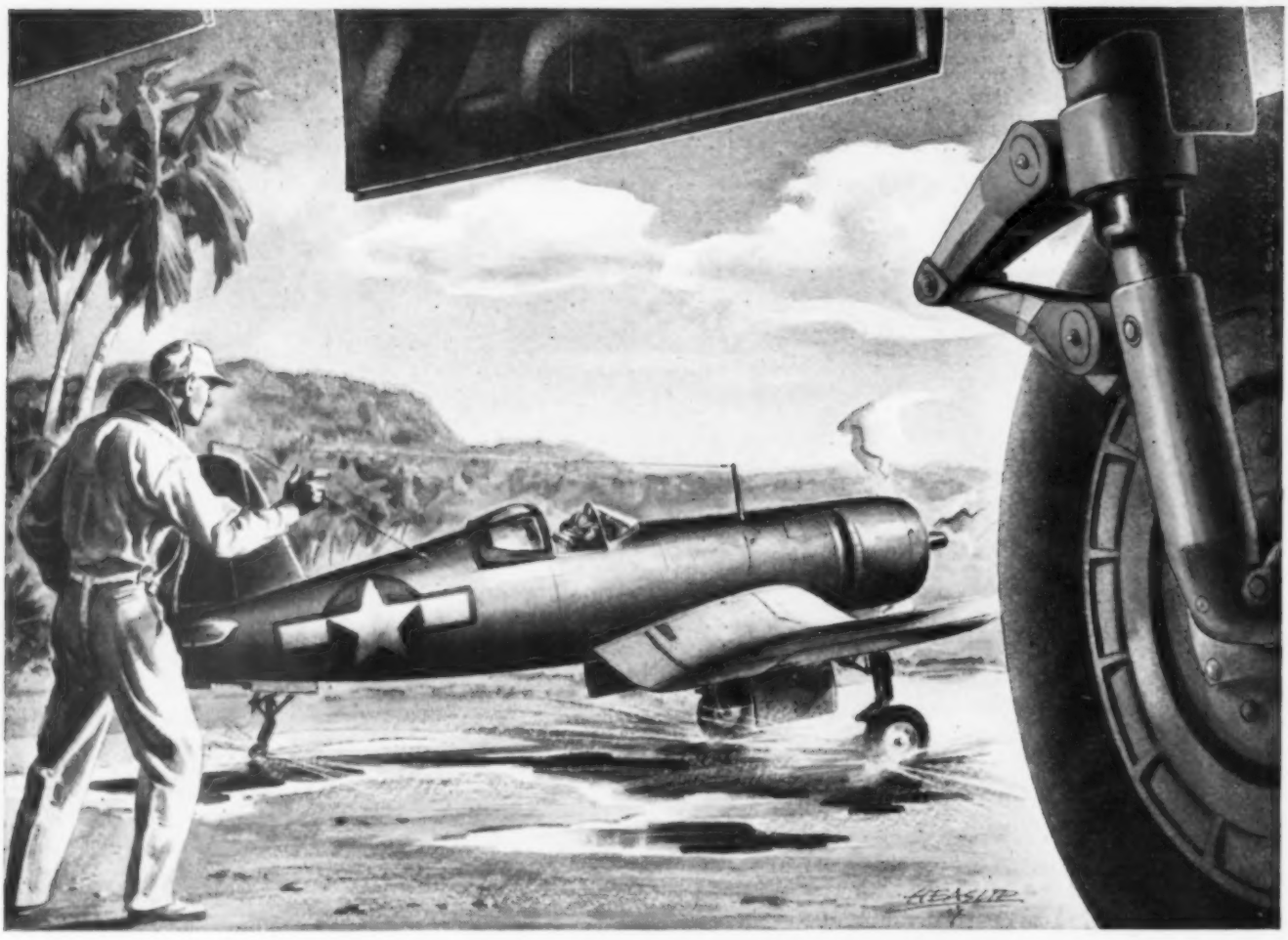
DIVISION OF **Bendix** AVIATION CORPORATION
SIDNEY, N. Y.

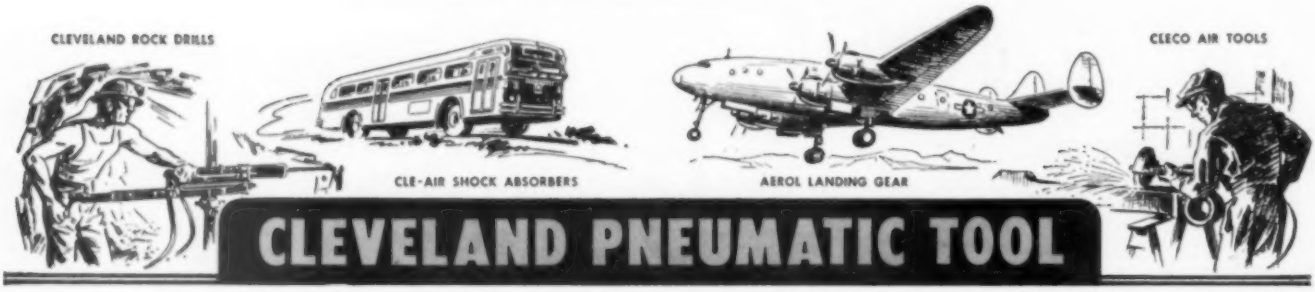


Planes that CARRY *their "landing strips"*

Emergency landings on rain-soaked jungle runways are not infrequent in today's global warfare. Even on such tough terrain, AEROLS (Cleveland Pneumatic shock-absorbing landing gear) protect the plane and pilot by helping insure a safe, smooth landing. ◆ Today, AEROLS are contributing substantially to the efficiency of military planes; tomorrow, they will provide even greater comfort in the *age of flight.* ◆ Our products, serving many major industrial fields, are mentioned below. Whatever your needs, Cleveland Pneumatic Tool engineers offer you the benefit of over 50 years manufacturing experience.

THE CLEVELAND PNEUMATIC TOOL CO., Cleveland 5, Ohio

Speed Final Victory! Buy MORE War Bonds



CLEVELAND PNEUMATIC TOOL

. . . Count on Curtiss Commandos

FOR PASSENGER COMFORT

Smooth flying characteristics and luxurious appointments will provide new comfort for passengers who travel in postwar Commandos.

Adequate aisle space will permit walking through the big roomy cabin without annoying other passengers. There will be plenty of leg room between the seats themselves. Cabin temperature will be maintained at 70° with a complete change of air every two minutes.

Ample lighting will be provided by fluorescent ceiling fitments and individual reading lights that will not interfere with adjacent passengers.

The cabin will be so insulated that one may converse in a normal tone—and the mechanized sky-kitchenette will provide rapid service of foods, sizzling hot or properly chilled.

Curtiss-Wright cordially invites airline operators to study Commando comforts in detail, certain that they will recognize their travel-stimulating, revenue-building values. Curtiss-Wright Corporation, Airplane Division.

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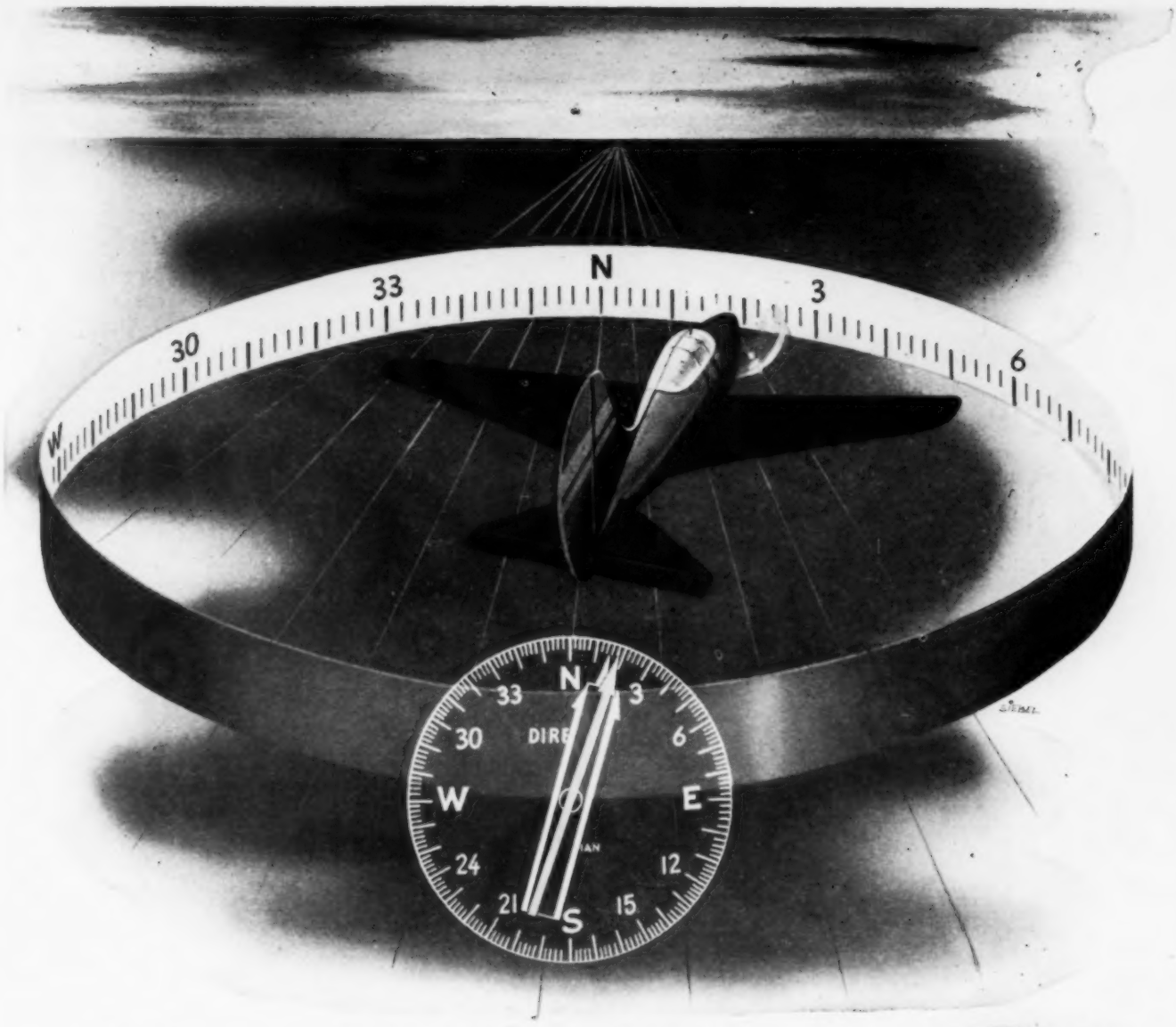
FOR ACHIEVEMENT IN THE AIR

U. S. Navy's Grumman Hellcats on Combat Patrol

Grumman

AIRCRAFT ENGINEERING CORPORATION, Bethpage, L. I., N. Y.



A Compass that Actually *Points!*

The flight-like indication of the new Kollsman Direction Indicator achieves a new realism in compass indication which has won the enthusiasm of many pilots. It exposes an entire 360° compass rose to view while its needle points the direction in which the plane is heading. Further, an index pointer is included which can be set to the desired compass course. The pilot thenceforth has only to keep the pointers matched. This new instrument is typical of Kollsman's continuous effort to make flying easier, more exact, safer . . . thereby increasing the utility and effectiveness of the airplane.

Write today for the illustrated folder describing the new Kollsman Direction Indicator. Kollsman Instrument Division, Square D Company, 80-08 45th Avenue, Elmhurst, New York.

The Kollsman Direction Indicator is self-contained, with magnetic compass element of excellent performance characteristics. Very little "overswing", exceptionally stable pointer. Mounts on instrument panel like any standard compass.

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AIR REPORT

SIGNIFICANT TRENDS IN THE NEWS

Trail-Blazing Feeder Survey

An exhaustive analysis of feederline route applications, CAB policies, economic factors and operational needs has revealed significant short-haul prospects including 3.5-cents-per-mile passenger fares and a potential market for 500 to 600 new feeder-type planes within three years. Fairchild Engine and Airplane Corporation's development division, directed by Dean C. Smith, conducted the analysis, and comes forth with some extraordinary statements such as this: "Short hauls would demand high frequency of service and fares less than half present airline rates . . . there is no existing airplane capable of providing the economical and efficient transportation required by projected feederline service." The "ideal" short-haul transport should have, according to Fairchild, flexible capacity for eight to twelve passengers and 200 to 1,000 pounds of cargo, provide mail-express pickup service and cruise at 165 mph. About 230-mile range with full payload, 315 miles with 70 per cent payload and absolute range of 470 miles with 35 per cent payload, including fuel reserves, should be satisfactory. Such an "ideal" plane is estimated by Fairchild to cost from $50,000 to $70,000 and should operate on a 17 to 20-cent-per-airplane-mile direct operating cost. "If," says the company, "indirect expenses are double this direct flying expense, operators could achieve the desired passenger fare of 3.5 cents per passenger mile, assuming express revenue would not exceed that now realized, and that there would be a compensatory mail rate." Other data unearthed by the analysis included: Feeder applica-

3 Popular Models of the ★★★ WALLER COMMUNICATOR LINE

- Model AB39, Power 20 watts, 20 lbs., 2 Frequencies $437.50
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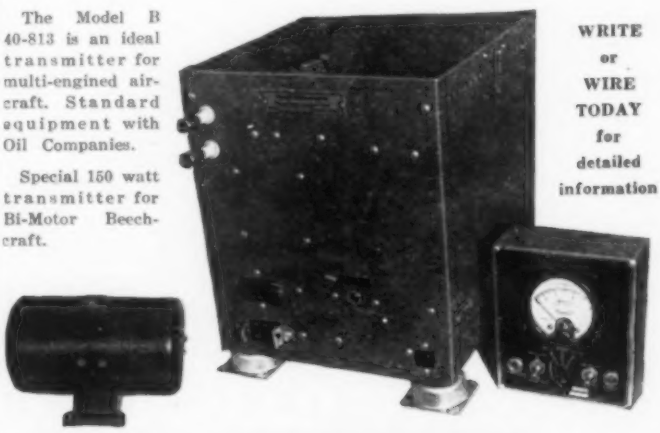
- Model B40-813, Power 150 watts, 62 lbs., 2 Frequencies $1400.00

Also a complete line of two-way radio combinations for light airplanes. Expertly engineered and built to the most efficient performance standards.

The Model B 40-813 is an ideal transmitter for multi-engined aircraft. Standard equipment with Oil Companies.

Special 150 watt transmitter for Bi-Motor Beechcraft.



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. . . draw the line AND *FLY IT!*

WITH THE Sperry Gyrosyn Compass you can do just that! It gives dead-beat indications . . . accurate magnetic headings . . . is without northerly turning error, oscillation or swinging. And it does *not* require resetting.

This flight and navigation instrument is a Directional *Gyro syn*chronized with the earth's magnetic field, providing stable indication under all conditions of air turbulence. Write our Aeronautical Department for information.

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"SINGLE-RELEASE" Harness

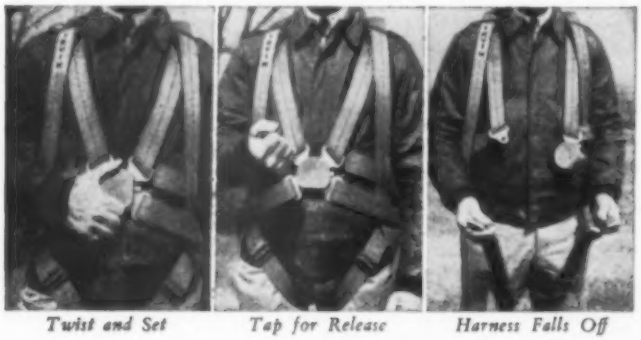
UNITED NATIONS' FLYERS

are using it for

SAFER LANDINGS

A one-hand turn and a tap on the single frontal disk instantly releases the harness . . . leaving the flyer entirely free. Accidental release is impossible before disk is "set" for action.

All United Nations' Air Forces for years have used IRVIN as standard equipment . . . and now the Irvin "Single-Release" harness is acknowledged as superior for all landings. IRVIN, as always, leads in Safety.



Twist and Set *Tap for Release* *Harness Falls Off*

IRVING AIR CHUTE CO., Inc.

Main Office: 1670 Jefferson Ave., Buffalo 8, N. Y.

Complete Factories in Buffalo, N. Y., Glendale, Calif. (1500 Flower St.), and Lexington, Ky., U. S. A. . . . Canada, England and Sweden . . . All Serving the United Nations' Air Forces.

BUY MORE WAR BONDS

tions average 358 miles per route, with fifty-four miles between stops and nineteen miles between mail and express pickups. . . . There are 5.5 stops and 17.8 pickups per route. . . . Each route would cross other airline routes about every 140 miles.

★ ★ ★

Airplanes or Soldiers?

Aircraft workers drafted into the Army and Navy have mostly been replaced by elaborate but efficient training of recruits, but recent increases in Selective Service calls affecting highly-skilled key personnel have created serious problems for the industry. A crisis is expected by or during April, when officials will have to decide whether they want airplanes or soldiers from the factories.

★ ★ ★

Wichita Busy on Postwar Models

Although little factual talk is available there, Wichita, Kansas, the "most air-minded town in the world," will have several postwar lightplanes ready soon. Culver's design has been mentioned but without details other than emphasis on new safety factors. Still hush-hush is Beech's new single-engine lightplane. A third new model to watch is one designed and built by Rawdon Brothers Flying Service at their shop across the road from Beech. A two-place low-wing, it is ready for complete flight testing. Still being kept secret, despite widespread advertising of a proposed "Family Plane of the Air," is Cessna's postwar model.

★ ★ ★

SKYLARK
AIRPLANE & PARTS CRAFTSMEN
SINCE 1934
Skylark Manufacturing Co., Inc., Venice, Calif.

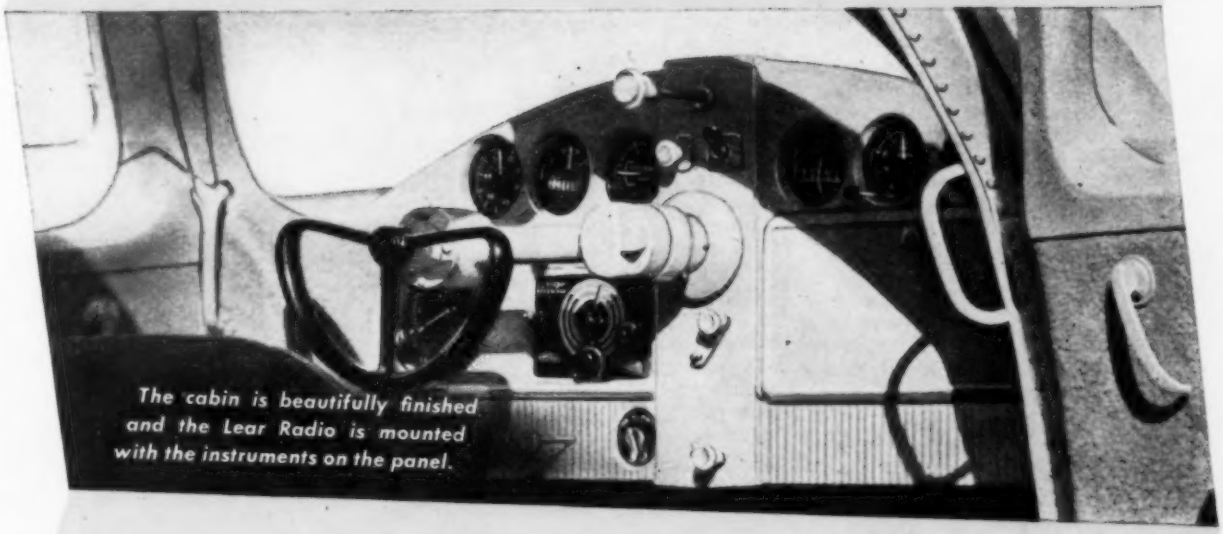
NOTE:

Look to Skycraft

PRIVATE AIRPLANES FOR BETTER—SAFER POSTWAR TRANSPORTATION

Republic Aviation Corporation's new postwar amphibian flies with Lear Radio. This experimental model is Lear-equipped and all tests have been flown with it.

Looking Ahead with Lear



The cabin is beautifully finished and the Lear Radio is mounted with the instruments on the panel.

A new plane is stretching its wings. Kin to the Army's famous fighter, Republic's Thunderbolt Amphibian will make its bid as the postwar personal plane.

Grouped with the instruments on its neat panel is a Lear Aircraft Radio. For Republic knows well the long successful history of Lear in producing fine radios for the exacting needs of flying.

Since 1930, Lear has been a specialist in fine aircraft radio instruments and direction-finding equipment. They have won a reputation for being light, keenly sensitive and unusually dependable.

Of course, all Lear production now goes only where Uncle Sam says. But aircraft operators can look ahead to the days when Lear aircraft equipment, improved and developed by its work in war, will again be available.

Radio Division: Grand Rapids 2, Michigan
Aircraft Radio Sales: 1860 Broadway, New York 23, N. Y.
West Coast Subsidiary: Lear, Inc. of Calif.
1010 N. Highland Ave., Los Angeles 38, Calif.

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Lear INCORPORATED

THE Sky's the Limit

BY BILL GREEN

Requirements for postwar airplane utility. . . . How to eliminate weight and reduce costs. . . . Many new airports are needed, but let's avoid mistakes of the past. . . . Electronic gadgets are good —if you need them.

Approach to Economical Flying

WE continue to read advertising material, propaganda, and just plain dogmatic statements from people about how the aircraft industry will progress after the war.

In previous issues, we have set forth our own ideas on the subject and these deal mostly with the notion that not a great many people can afford to own airplanes and automobiles unless the airplanes are both useful and economical.

Along the lines of economy, of course the airplane sold to the greatest number of people (other than for training and Sunday flying purposes) must be an airplane capable of some speed, some performance, and yet be lightweight and inexpensive.

The other day we heard from an engine manufacturer that he now has a lightweight engine that does not weigh over 125 pounds dry, without starter or generator. The starter and generator add approximately thirty pounds. Thus, if this airplane is going to have the proper accessories, it will be overloaded with electrical accessories, at least considering the kind of accessories we have at present.

When you add thirty pounds of generator and starter, twenty pounds of battery, battery box and cables, some two-way radio equipment, and other accessories, including starter switch, fuse boxes, generator cutout, etc., etc., etc., you soon find you add not thirty pounds but sixty or seventy pounds, for such equipment.

We have long considered certain ideas which would probably permit a much lighter over-all engine installation of a given horsepower and we herewith hand to all and sundry certain of those ideas:

1. Some sort of mechanical starter which would permit the kicking over of an engine from inside the cockpit without too strenuous an effort would eliminate the starter, starter switch, and the heavy cables required for it. It could possibly eliminate the battery and battery box, too, as in the following case.

2. Probably someone could develop a voltage control for generator so that no battery would be required for the operation of radio equipment, flight instruments, etc. They would be operated from the generator while the engine was turning over. After all, if you have a starter, there is no necessity to have a storage battery.

3. Either a ratchet-type kick starter or some light form of inertia or shotgun-shell starter might be used advantageously.

These ideas are simply some to be considered by the engine designers and be incorporated into the engine. Naturally, if an accessory is bolted to the outside of an engine, then it is going to weigh considerably more because it will require its own housing, bracket, mountings, etc. Personally, we favor some kind of ratchet or inertia starter as opposed to a vacuum or air pressure starter. The engine can be kicked over repeatedly with an inertia or ratchet starter but could not be kicked over more than two or three times with types other than electrical.

The largest single unit of weight in most aircraft is the engine and accessories and we have found out many times to our sorrow that every few pounds hauled in an airplane cut down the performance, speed and miles per gallon. Therefore, it behooves us to remove every pound that possibly can be eliminated without loss of safety and thus use correspondingly smaller, lighter, and less expensive engines, assuming we would be satisfied with the same performance.

We have long been a devotee to the benefits of private enterprise and we sincerely hope aircraft and engine manufacturers will get their heads together and develop postwar equipment without having to call for governmental assistance in the form of subsidies, or government-owned plants. We believe almost any manufacturer can write his own ticket if he chooses to do so. We must keep in mind that practically all worthwhile developments in this country were privately done, usually by individuals or small companies. With increasing knowledge and experience, we should be able to take this bull by the horn and work it out successfully.

Practical Airport Planning

We note in the press that many communities are now voting bonds for airports and others are considering plans for great new airports and we are quite happy about it all, since every available landing field will increase safety and utility of aviation.

On the other hand, however, we believe the greatest stimulus to aviation will come not from the establishment of thousands of airports many of which may never be used but from the development of a light, useful and satisfactory small airplane priced within the reach of thousands of people.

There will be those who say airports stimulate the sale of airplanes. That is true. However, we would like to point out a few facts for general consideration.

1. Taxes everywhere are too high. They are retarding business and cramping individuals. If many thousands of new airports are to be built, they would mean the increasing of taxes, not reduction.

2. In times past, many airports have been built but never used. On our jaunts around the country, we have seen some of these abandoned fields which we once helped to dedicate. There is certainly no sense or value to anyone in the construction of unnecessary airports.

3. No one knows what the development of aviation is going to be. We may have jet-propelled aircraft, even jet-propelled helicopters, and these things will not need the same airport as conventional aircraft require.

4. If airports are constructed and placed in operation under people who do not properly appreciate all the phases and requirements of aviation, they are more apt to hamper the growth of aviation in that locality than to help it. On the other hand, if an airport springs up in a locality because of necessity, it will probably be operated by someone who has a genuine interest in aviation, and has more chance for success.

We certainly do not favor more than one municipal airport in any vicinity as we believe, in general, that municipal airports cost the taxpayers whereas private airports do not. We are also strongly in favor of the principles of private enterprise and we believe in letting individuals or companies operate them as far as possible.

Ready, willing and waiting . . .

For nearly two decades we have been recognized by the aviation industry as a reliable source of off-the-shelf general supplies and equipment . . . Since the war our time and talents have been devoted largely to the production of specialty accessories of our own design and engineering . . . Only to a restricted degree were we able to maintain relationship with our peacetime trade . . . But today, Air Associates four strategically located offices and warehouses, efficiently staffed and adequately stocked —are again fully prepared to serve the many needs of private and commercial aviation. Remember—whenever you require anything in aeronautical supplies or equipment—shipped anywhere—for prompt attention and proper prices, call on Air Associates!

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TETERBORO, N. J. . . . *BRANCHES:* CHICAGO, DALLAS, LOS ANGELES . . .
ENGINEERS & MANUFACTURERS OF AIRCRAFT SPECIALTIES . . .
SUPPLIERS OF ALL TYPES OF MATERIALS TO THE INDUSTRY SINCE 1927

More ideas can be developed, new methods and improvements will be forthcoming as free enterprise provides the stimulus for these things. Too often, government, either national, state or municipal, tends to be of a stereotyped form that inhibits the growth of new ideas and improvements, to say the least.

Elbow Grease vs. Electronics

During this winter we have had to change our plans several times and go on the train rather than attempt to use our own private plane. The things the airlines can do in many cases with their twin-engine equipment and all sorts of instruments, may not be done by private pilots under many circumstances with complete impunity.

We think one of the greatest boons to flying would be the development of some kind of special glasses or some other similar and simple device to permit seeing through clouds or fog.

We are aware of the fact it is possible to see through fog, cloud, etc. From what we have heard about it, though, we gather it requires considerable bulky and complicated equipment to do it. There are two things wrong with that. First, all airplanes can't carry all of that stuff and still be useful, and, second, complicated equipment has a way of quitting once in a while. While we don't want a hundred per cent chance on everything that we do, and have frequently settled for a fifty-fifty or less, we still believe that statistically it would be pretty bad for aviation if half the people who fly on instruments would crack up.

From time to time it may seem we are a bit heretical, and if so, the chips must fall where they may. Anyhow, we must make this statement: Far from expecting all our problems to be solved by electronics, by radar, by complicated gadgets, of every kind, size, shape and description, it is our impression we must return eventually to a simpler way of doing things. This simpler way probably means individuals may have to use a little more elbow grease and do a little less button pushing.

At one time we were an electronic expert ourselves, and we still do a considerable business in electronic equipment. Wherever such equipment, or any complex and costly equipment pays dividends, it should be used, but the people must eventually be educated to the fact they have but one quantity of money and they can get more for their money if they will do a little effort or work themselves than if they depend on someone else to do all the work while they only push buttons.

There probably never was a simpler, cheaper, and more fool-proof landing gear retracting mechanism than that developed by Culver and used on some 400 of their airplanes. This mechanism consisted of a little handwheel and it was possible to raise or lower the gear with three or four revolutions of this handwheel. I never heard anyone complain it was difficult to raise or lower. (To those people who will say it didn't work sometimes, I may say mistreatment will make anything fail occasionally, and although I put a lot of time on two different airplanes, my retracting mechanism never fails to work.) We know of other airplanes using a hydraulic pump and a hydraulic cylinder for raising the gear. This works fine but has several additional parts which may give trouble. Also, it costs more money.

During this war we have built hydraulic and mechanical gear retracting assemblies for a number of airplane companies and have had an opportunity thus to compare engineering and to see the good features of several different designs. A feature many aeronautical engineers could well ponder at length is the manifold advantage of attempting to balance (or perhaps better counter-balance) the different loads that must be handled. For example, Beech, in their single engine biplane, have for many years used a shock-cord counterbalance for the landing gear. When this is adjusted properly, the gear has almost exactly the same load going down as coming up. This is a constant load, therefore, and friction alone must be overcome. Counterbalancing has been used on engine, pumping equipment, and other devices for a long time. It is even used by the best engineers in electronic equipment. In a great many cases, it is possible to counterbalance a load by design only and without the addition of extra counterweight or other equipment.

We are of the opinion that no one yet has even reasonably exhausted the possibilities of light and efficient construction of aircraft and we look for some startling new design in the future. ★ ★ ★

Airmen's Calendar

April 4-6—Society of Automotive Engineers, National Aeronautics meeting, Hotel New Yorker, New York.

April 10-11 — Airplane Technical committee, ACCA, New Orleans.

April 13-14—National Airworthiness Requirements committee, ACCA, New Orleans.

May 6-9—First annual convention, International Aviation Fraternity, Miami Beach.

October 31-November 3—1945 National Aviation Clinic, Oklahoma City.

Makers of Precision small parts for the Aviation Industry
★ ABILITY ★ PRECISION ★ PRODUCTION
DOLAN AIRCRAFT MANUFACTURING COMPANY
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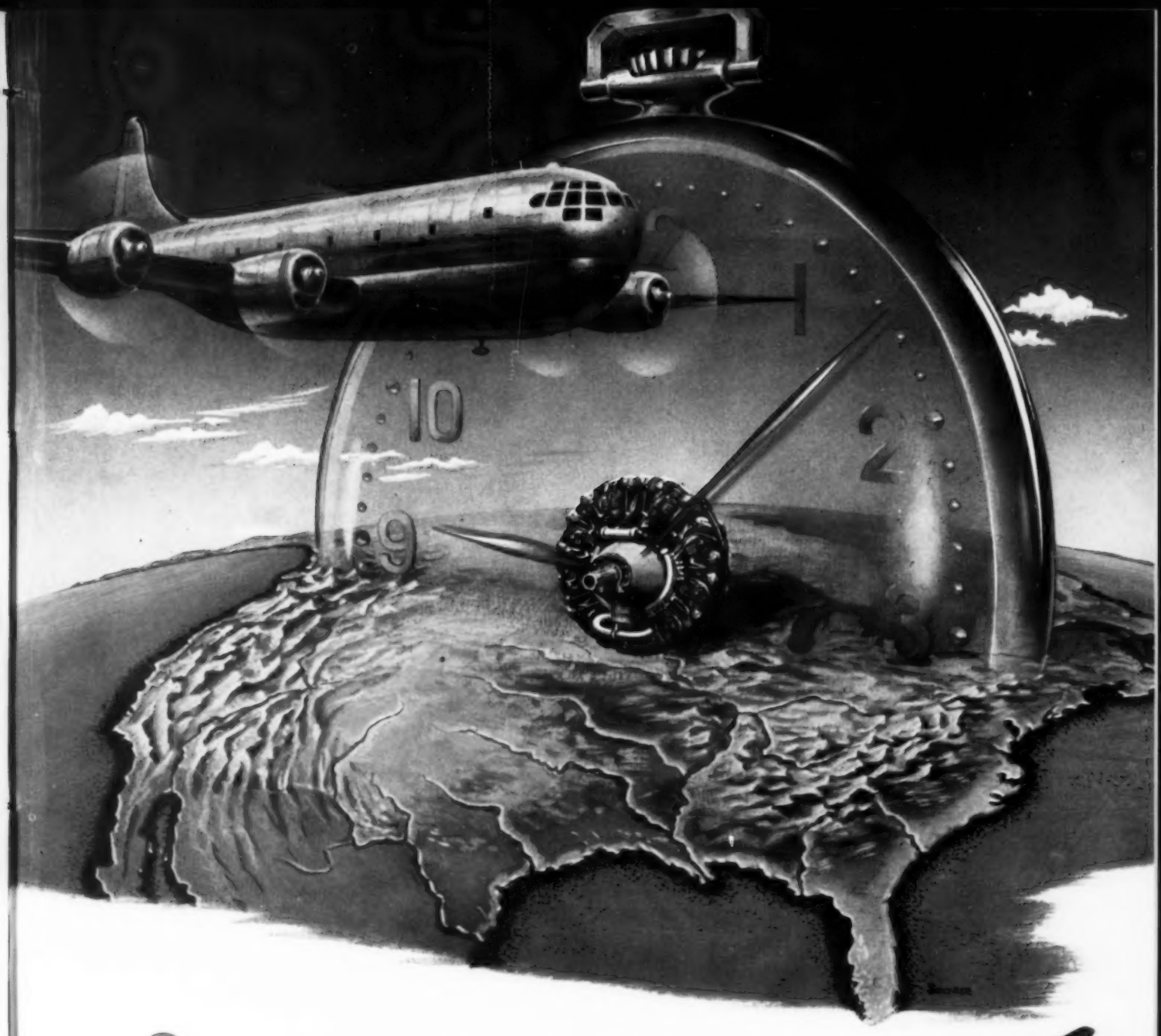


Only six hours wide - with Cyclones

Flying with Cyclone power, the Boeing C-97 transport in its six-hour record flight from Seattle to Washington proved once again: aviation's military research benefits all aviation.

The Cyclone 18's used in this new plane came from an accelerated development program for the mighty Boeing B-29 Superfortress. The result was a superb engine for high speed flight of heavy payloads of any type—bombs, cargo or passengers. The record performances of the Lockheed Constellation and Martin Mars, likewise powered, bear this out. In fact, the Cyclone 18 is the only engine of over 2,000 horsepower used in four-engined service airplanes of any type. Its constant service development thus keeps it well in advance of new operational requirements.

WRIGHT AERONAUTICAL CORPORATION
Paterson, New Jersey, U. S. A.

In the Superfortresses, too

Cyclones Save 3 Ways

LESS WEIGHT—MORE PAYLOAD
LOWER FUEL CONSUMPTION
REDUCED MAINTENANCE

WRIGHT

Aircraft Engines

A Division of
CURTISS-WRIGHT CORPORATION

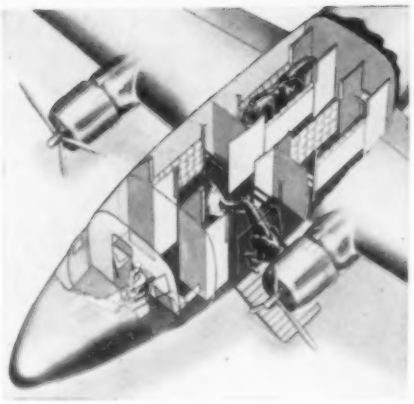
WRIGHT POWERS THE TONNAGE OF THE AIR

REVVING UP

(Continued from page 4)

SHORT SNORTS: John H. Wilson has resigned as executive director of National Aviation Trades Association effective March 15. His work will be carried on by Clarence Mooney until the board of governors picks his successor. . . . Air travelers in and out of San Antonio's Municipal Airport are high in praise of the local airport management for expediting baggage handling and for providing comfort and protection from the weather with an attractive shed across the front of the passenger waiting room. . . . Once scarce items are beginning to show up on the shelves of aviation supply houses as revealed by Bob Kenty, Air Associates' Dallas branch manager, who points with satisfaction to a supply of pinking shears, scotch tape, flying boots and other such luxuries. . . . Speaking of supply houses look for the early production of new and expanded catalogs from all corners of the compass; among those in preparation are Aviation Supply Corporation's dealer catalogue and Southwest Airmotive's composite catalogue of parts and accessories they distribute in the Southwestern area. . . . Sharply reduced airline fares are now a certainty with American and TWA restoring the 5 per cent discount to travel card holders and United asking for permission to cut 13 per cent. . . . Other aviation magazines are beginning to come around to the principles governing surplus aircraft disposal policies urged by SOUTHERN FLIGHT last Summer, now that the DPC and all surplus agencies have made such a mess of surplus handling to the detriment of legitimate aviation enterprise. . . . John B. Hughes, the popular West Coast broadcaster and writer, paid us a visit last month on returning from a tour of the Southwest Pacific as a war correspondent. He went ashore in a couple of invasions and on Leyte learned first-hand the value of air support. "For five days straight the Japs had us without air support," he said, "before a P-38 outfit roared in. Hurrying to refuel, they went upstairs quick and knocked hell out of a big flight of Jap raiders." . . . North American Aviation, as could be expected, has a "super" Mustang but details are not available.

NEW HELLDIVER operating for the Navy is Curtiss SB2C-4, which carries eight 5-in. rockets in addition to its 20-mm. cannon. New perforated dive-flaps have improved bombing accuracy.
—(Curtiss-Wright Photo.)



FLYING STABLE was pictured last month as a possible conversion of Hughes Aircraft Company's new "Feederliner" (see page 82). Three horses can be accommodated, as this artist's sketch shows.
—(Hughes Photo.)

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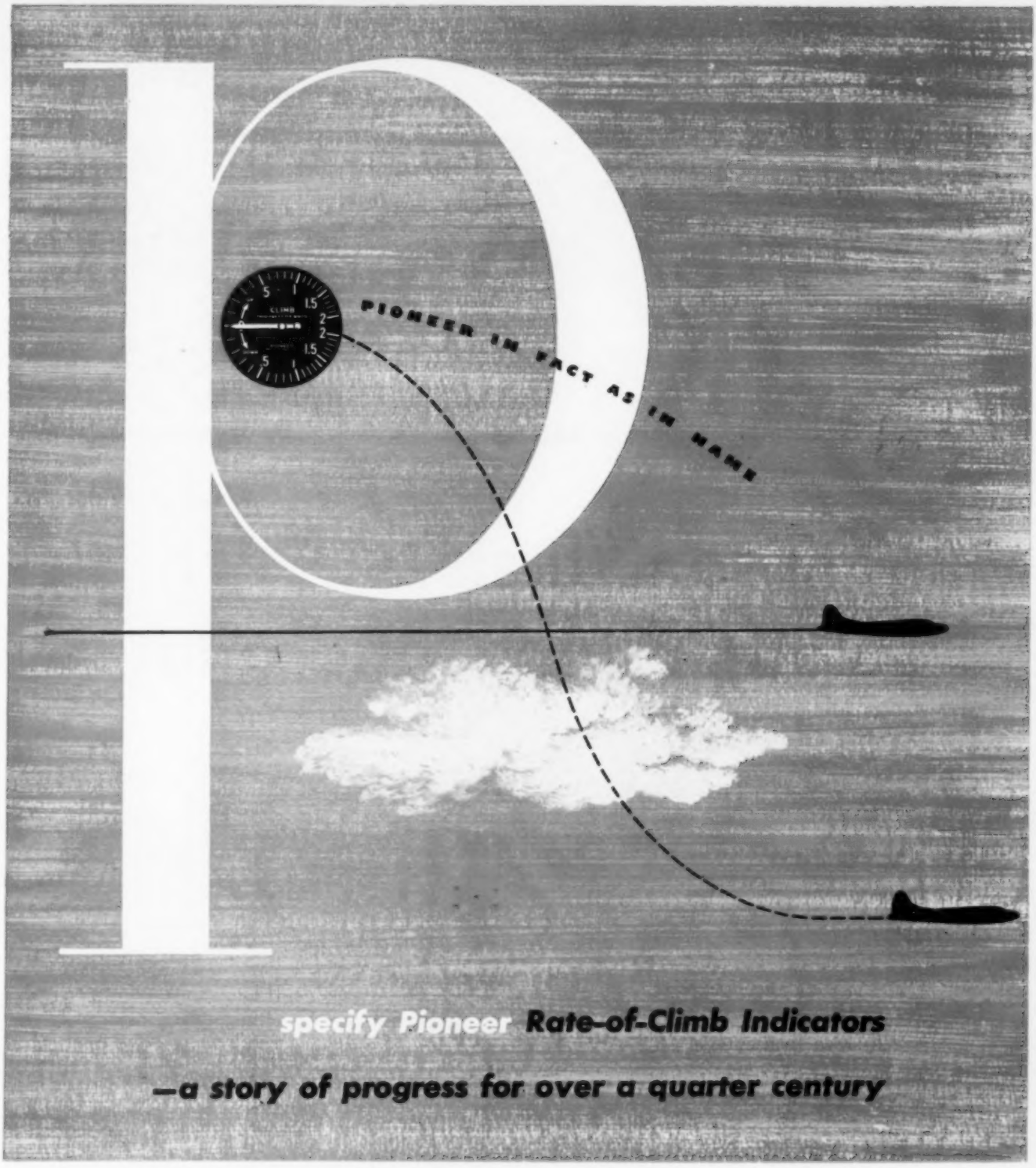

In 1919 an instrument for measuring the rate of climb or descent of an aircraft was mounted on the panel of a U. S. Navy experimental plane at the Naval Aircraft Factory in Philadelphia. This early "thermos bottle-and-case" was Pioneer's—and the world's—first Rate-of-Climb Indicator, Type 132.

Today the Pioneer Type 1636 Rate-of-Climb Indicator, sensitively compensated for temperature and altitude changes, is specified as standard equipment for thousands of aircraft throughout the world.

This record of progress in blind-flying and instrument-approach avigation is another example of Pioneer creative engineering, ceaselessly striving for maximum reliability, accuracy, and sensitivity.

PIONEER INSTRUMENTS

ECLIPSE-PIONEER DIVISION

Bendix AVIATION CORPORATION

Teterboro, N. J.

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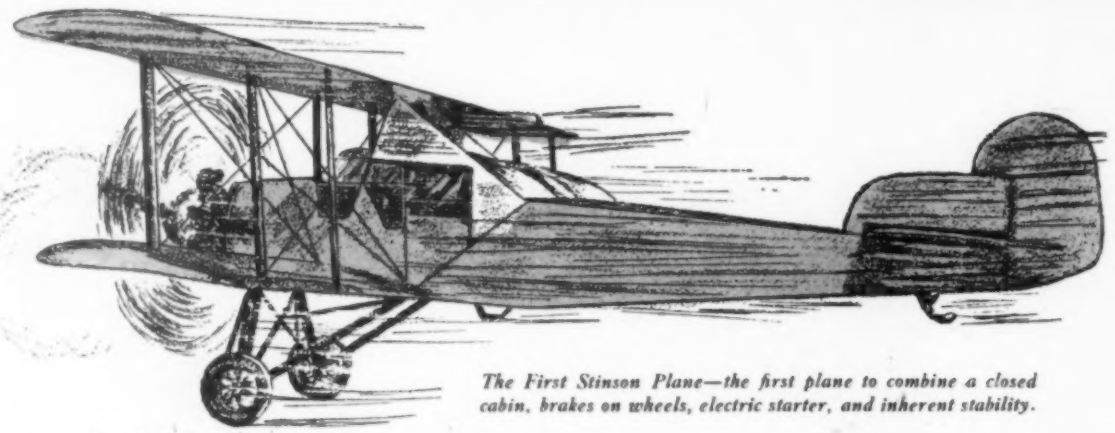


The First Stinson Plane—the first plane to combine a closed cabin, brakes on wheels, electric starter, and inherent stability.

Stinson "firsts"— before, during, and after

THE NAME "STINSON" has been associated with personal plane aviation leadership ever since that name was first given to an airplane, back in 1926.

When this 1926 Stinson took to the air, it carried aloft an impressive number of "firsts."

DESIGN "FIRSTS"

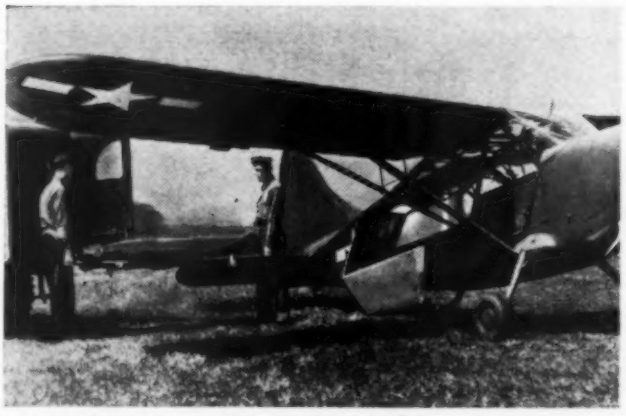
Stinson was the first plane to combine the following features:

- An enclosed cabin
- The safety afforded by brakes on landing wheels
- The convenience of an electric starter
- The comfort of a cabin heater

PREWAR PERFORMANCE "FIRSTS"

During the past 19 years Stinson has piled up an impressive number of performance "firsts" in the fields of commercial and personal flying:

- A Stinson plane carried the first air mail in China
- It carried the first government mail in Mexico and in the Philippines
- Made the first flight from Detroit to Tokyo, and from New York to Bermuda
- Inaugurated the world's first air-mail pick-up service
- First explored the Greenland route to Europe, the present-day route of the North Atlantic Air Ferry.



Stinson "Flying Jeeps" serve the armed forces as flying ambulances, observation and liaison planes, under the toughest flying conditions.

STINSON "FIRSTS" DURING THE WAR

Stinson's main wartime job has been the manufacture of liaison and training planes for our fighting forces—the Stinson Sentinel, or "Flying Jeep," the Stinson Vigilant L-1, and the Stinson Reliant AT-19.

A Stinson Sentinel, hopping from the deck of a carrier, was the first American plane to land on Jap-infested Pelelieu Island, while U. S. Marines were slugging it out for the beachhead . . . only one typical instance of many similar occurrences when Stinson planes took part in invasions.

"Out in front" of the front, these sturdy little Stinson "Flying Jeeps" are serving as the "eyes" of the armed forces, as flying ambulances, and on important liaison duty.

The Stinson Voyager is the No. 1 plane of the Civil Air Patrol. It has the distinction of carrying out 65 per cent of the Patrol's wartime operations, which have included the sinking of a number of submarines and the saving of hundreds of lives.

The Stinson Reliant AT-19 has been widely used as a navigational trainer by the British. And almost every airline in the United States uses Stinson planes to train and check their pilots.

The Stinson "Flying Jeep"—wartime successor to the peacetime Voyager—has demonstrated its stamina and utility as the No. 1 liaison plane of the Army, Navy, and Marine Corps all over the world.

THE STINSON VOYAGER 125 . . .
the No. 1 Plane for Postwar Personal Flying

The first postwar personal plane designed by Stinson—the Voyager 125—combines the *safety* and *reliability* of the prewar Voyagers with the *toughness* and *utility* of the Stinson "Flying Jeep."

Here are some of the high lights of this quality personal plane—

- Carries three passengers in addition to pilot.
- Maximum speed of 123 m.p.h. at sea level.
- Range of 470 miles without refueling.
- Service ceiling 14,000 ft.
- 545-ft. take-off run; 265-ft. landing roll—with flaps down.
- Powered by 125 h.p. engine.
- Cruising speed of 112 m.p.h. at 83 per cent power.
- Rate of climb—750 ft. per minute at sea level.

Parts for Stinson Planes. We are now making a full line of parts for the thousands of Stinson planes now in service. Order spare parts for your Stinson from your local Stinson distributor or direct from the factory.

Stinson

The Aircraft Standard of the World

Division of Consolidated Vultee Aircraft Corporation, Wayne, Michigan

The Stinson Voyager 125 is the forerunner of a distinguished line of planes for personal flying that Stinson will make as soon as war conditions permit.

We welcome inquiries about the Voyager 125 and about Stinson's postwar plans. Write to Private Sales Director, Stinson Division, Consolidated Vultee Aircraft Corporation, Wayne, Michigan.

NEW RECORDS FOR SIZE AND PERFORMANCE are expected of Consolidated Vultee Aircraft Corporation's 160-ton, 204-passenger Model 37, which Pan American Airways will operate on Atlantic and Pacific routes. The 230-ft. wing mounts six pusher engines of an undisclosed type but which are indicated as developing a total of about 30,000 hp. Fuselage is 182 feet long, of double-deck construction and is pressurized for 30,000-ft. operations. Largest landplane yet designed, a fleet of as many as fifteen ordered by PAA is expected to cost approximately $3,000,000 each.

—(Consolidated Vultee Drawing.)

Convair's Model 37 Clipper

Dwarfing all other designs, America's newest sky giant challenges world transport competition with advanced airplane and power plant engineering.

By E. H. PICKERING

WITH 90 per cent of the engineering and a full-scale mock-up completed, the wraps have been lifted by Consolidated Vultee Aircraft Corporation from its huge Model 37, a 320,000-lb., six-engine pusher-type larger than any landplane yet proposed. The unveiling came with announcement that Pan American Airways had contracted for construction of a fleet of as many as fifteen of the 204-passenger Clippers—sufficient to fly 750,000 trans-Atlantic and trans-Pacific passengers annually.

Development of the airplane points up American supremacy in design, not only for air transport, in which postwar international competition is expected to have far-reaching significance, but for military purposes. Announcement of the new transport was not officially linked with any military developments, however.

Performance and specification data for the new plane include:

Gross weight	320,000 lbs.
Empty weight	157,492 lbs.
Useful weight	162,508 lbs.
Passengers	204
Cruising speed	342 mph.
Service ceiling	30,000 ft.
Range	4,200 miles
Power (6 pusher engines of undisclosed type and power)	30,000 hp. (est.)
Length	182 ft.
Wingspan	230 ft.
Height	57 ft.

May Use Turbines

In addition to being the largest landplane so far announced, Model 37 will have more power than any plane yet designed. Consolidated Vultee has referred to its engines only as "of a new type now under development" and which will "produce power equivalent to 352 average automobile engines." If an eighty-five-hp. Ford can be called "average," Model 37's total horsepower would approximate 30,000, or about 5,000 hp. for each of the six engines. In recent months several authorities on aircraft power plants, here and in England, have agreed that 4,000 to 5,000 horsepower represents the practical limit for reciprocating engines, and that gas turbines would be more efficient in that category and above.

For a range of 4,200 miles with full load, Model 37 will have a fuel capacity of 16,471 gallons and a lubricating oil capacity of 150 gallons. Fuel will be loaded through six tanks, which open on top of the wing. It is expected that two tank trucks will be able to fuel it in only thirty minutes, each truck using multiple lines. Model 37's fuel load is the equivalent of more than two

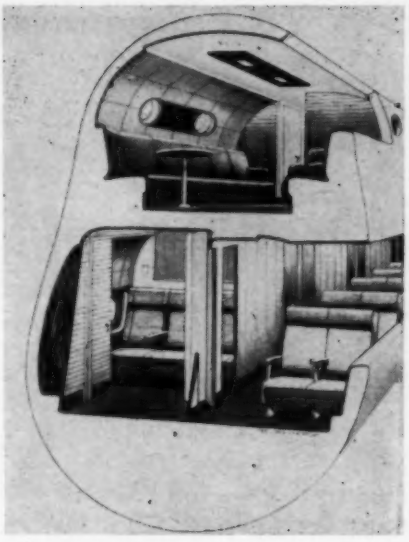
standard railroad tank cars and will weigh almost 100,000 pounds.

Record Low Operating Cost Indicated

In comparison with other "super" transports, it is about twice the size of Boeing's new Stratocruiser, a 108-passenger conversion of the B-29 and of which the C-97 is the prototype. It is as large or larger, in dimensions, as England's much-discussed Barbazon Type 1, designed to champion the British Overseas Airways Corporation's worldwide operations, but the proposed BOAC transport is in the 110-ton class as compared with Model 37's 160 tons.

Unprecedented operating efficiency is expected of the new Clipper because of its size. Whereas the useful load of a standard airliner ranges between 30 and 40 per cent of gross weight, more than 50 per cent, or better than half, of Model 37's gross is indicated as being useful. This recalls recent estimates by Pan American Airways bringing postwar passenger fares far below those charged before the war. While no official estimate is available, it is expected that Model 37's direct operating cost will compare favorably or eclipse the one-cent-per-passenger-mile direct operating cost of the Boeing Stratocruiser.

Pan American points out that a fleet of only eight Model 37's, supported by three of similar type in the six high-traffic summer months, would carry 442,764 passengers annually even if operated at only 50 per cent capacity. That volume is 67 per cent of all prewar passenger traffic moved on the North Atlantic by the ships of all nations. Three Model 37's operated at 50 per cent capacity would carry between Honolulu and California more



CROSS-SECTION of cabin shows day seats and compartments on lower deck and lounge accommodations on top level.

than three times the largest number of passengers carried by sea and air combined in any year prior to 1942. Flying time between New York and London will be slightly over nine hours.

Delivery of the new Clippers is not scheduled until after the war, and it is believed several years would be required to build fifteen of them. Although their cost has not been revealed, it probably will top $3,000,000 per plane.

Landing Facilities

At present, conventional tricycle landing gear is planned, with the main landing gear-tires measuring "approximately one foot greater in height than the average ceiling in a home," and distributing about 175,000 pounds over a ten-square-foot area. Because of this weight distribution, runways of several major U. S. airports are adequate for the plane. New York, Chicago, Detroit, Baltimore and Boston will receive Model 37 service, according to PAA. The big Clipper is said to be able to operate satisfactorily from runways such as are found at several Convair factories — 8,500 feet in length, 200 feet in width and twelve inches in thickness.

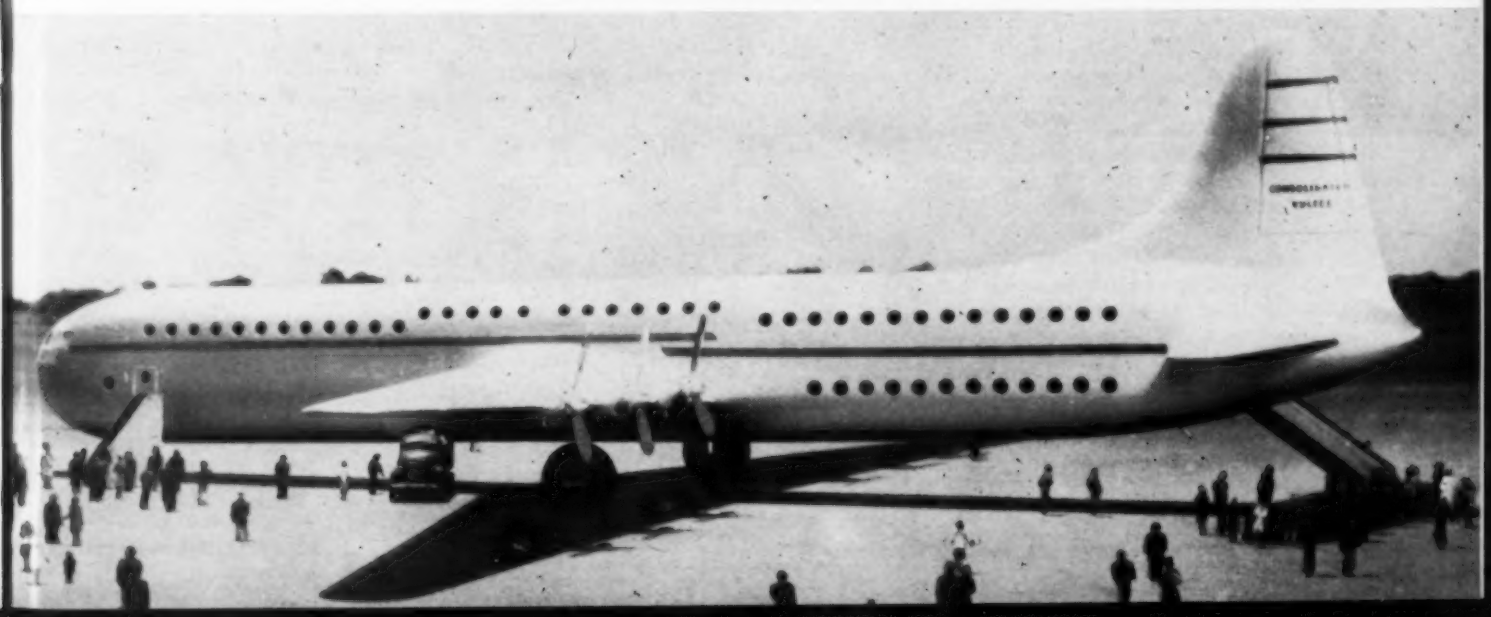
Hydraulic brakes are supplemented by emergency airbrakes for the wheels, and Model 37's inboard pusher propellers are reversed to augment its tremendous flaps in landing. Propeller reversing also facilitates ground handling.

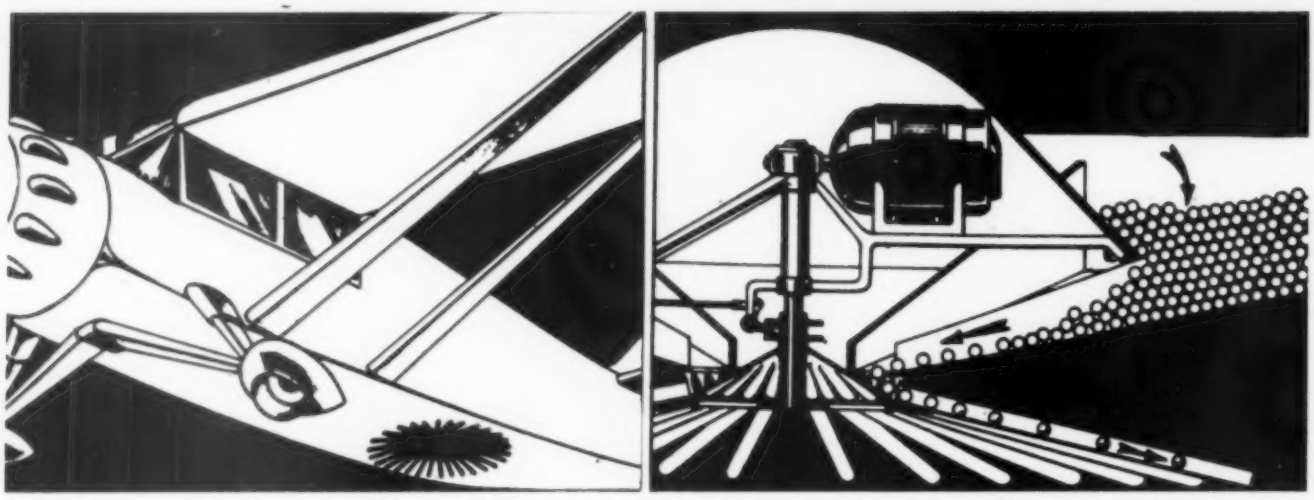
Double-Deck Cabin Pressurized

Of double-deck construction, the pressurized cabin for 204 passengers has been luxuriously designed by Henry Dreyfuss, and facilities include two large lounges in addition to spacious rest rooms, staterooms, berths and seats. Passengers enter the airplane from the side, forward of the wing, and from doors located in the rear, beneath the tail. While it is a mid-wing, the bottom of the fuselage is high off the ground, and a family auto can be driven under the fuselage with ample clearance.

Additional facts about the airplane include these from Consolidated Vultee: Blueprints for its construction would cover a sixteen-acre field; lumber used in the full-scale mock-up would construct three average homes; the 230-foot wing, if stood on end, would rise as high as a twenty-one-story building, and the tail is as high as a five-story building, while the huge propellers, of undisclosed type, extend higher than a two-story home. ★ ★ ★

GARGANTUAN SIZE OF SUPER CLIPPER is indicated by this photo of a model with toy people and miniature freight truck. Entire lower deck forward of wing is windowless, apparently being the main cargo hold. Propellers exceed 20-ft. diameter and rudder reaches 59 feet above ground. —(Consolidated Vultee Photo.)





Installation and operation of Dr. Lytle S. Adams' centrifugal planter are illustrated by these drawings. Seed pellets are shown at right as they would be fed into a whirling wheel of small pipes, shooting them downward in a spiral pattern.

Planting by Airplane

Taking his cue from Nature, the originator of air pickup offers ingenious means for utilizing aviation in widespread agricultural operations.

By TOM ASHLEY

DR. Lytle S. Adams, the Pennsylvania surgeon who fathered the pickup device which made possible air service to more than a hundred U. S. cities and towns, has come up with another aeronautical development — planting large quantities of seed from the air at incredible speeds.

"I've gone Mother Nature one better by duplicating bird and animal droppings," says Dr. Adams, who has interested Secretary of the Interior Harold L. Ickes, several Congressmen and many agriculturists in his latest undertaking. His first aviation contribution, the air pickup device, was more difficult to "sell," he says, forecasting a speedier and wider application for his newest idea. Legislation has been introduced in Congress which would appropriate $2,500,000 for a Federal seeding program using aerial planting.

Heretofore, only rice has been successfully planted by airplane on a large scale, other seed being too light in weight and mass to be dropped in a satisfactory pattern, and subject to destruction by animals or the elements before germination. But Dr. Adams believes he has overcome such obstacles by two means: (1) Perfection of a seed "pellet" and (2) sowing of pellets by a centrifugal machine attached to the bottom of the airplane.

241 Acres Planted Per Minute

The pellet consists of seed germ, from which the shell and chaff have been removed, coated by a mixture of soil containing growth-promoting vitamins and chemicals to repel insects and animals. Round in shape, the pellet has mass and weight sufficient to bury itself when dropped from the air onto soft ground, and planting is done immediately following a rain.

The centrifugal planter is a wheel, or impeller, of one-fourth-inch pipes, rotated at high speed by an electric motor. Pellets fed by gravity into the hub of the impeller are hurled from the spinning pipes in a circular pattern. The planting pattern can be varied by controlling the impeller's speed, the forward movement of the airplane and its altitude.

Interesting trademark of San Diego firm which manufactures seed pellets — small spheres of vitaminized soil containing seed germ and insect-rodent repellent.

Seed pellets, according to Dr. Adams, can be made inexpensively for almost every requirement. An average grass-seed pellet, used for revegetating the range, counts 1,920 to the pound. To plant an acre of range with one pellet per square foot requires 43,566 pellets, or 22.69 pounds. Airplane planting can be performed at the extremely fast rate of 241.66 acres per minute. Therefore, a large airplane is necessary because heavy loads of seed pellets must be carried (5,483 pounds can be planted per minute). But the airplane used for planting can be stripped of fuel and accessories, for the longest flight will be measured in minutes rather than hours. If a cargo airplane could carry ten tons of seed pellets, it could plant 831.54 acres in only three and one-half minutes.

"Planting by airplane, as we have arranged it, will be especially effective for revegetating lands in the public domain, in soil conservation districts and for reforestation," Dr. Adams says. "Protection of land values through proper grassing and the promotion of growth, together with the need of erosion and flood control, amounts to a gigantic undertaking in the West. In the United States and its possessions is an area of public lands embracing 750,000,000 acres. Because of its great

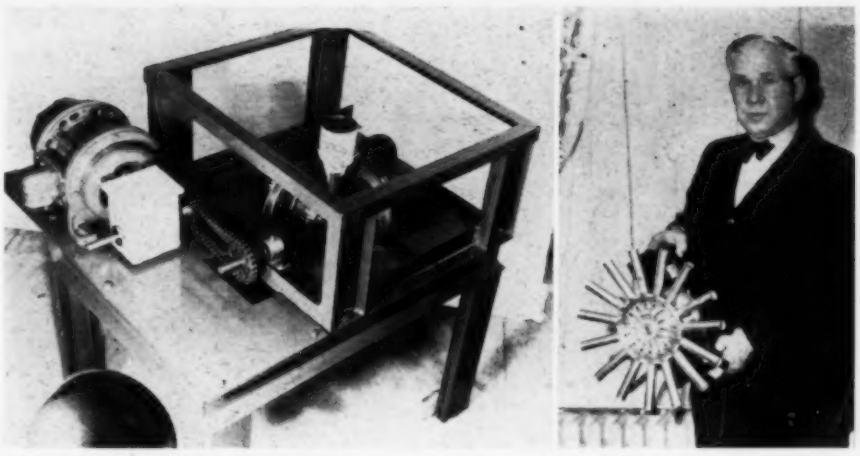
natural wealth, such land is administered by Federal agencies to protect its value and resources. Secretary Ickes has said that approximately 130 million acres of land administered by his department is in such condition from past improper use or neglect that some remedial action is necessary.

"Projectile" for Reforestation

"In the past, rehabilitation of the range has been attempted by patch planting, in which small areas here and there were cultivated and planted with grasses in the hope their growth would spread and eventually revegetate large areas. But what frequently happened was that animals, attracted to the small patches of new greenery in a vast expanse of dead growth, destroyed or prevented full growth of the new planting. In other cases both seed and loosened soil have been washed away by rains. One difficulty has been the neglect of inaccessible areas. The biggest problem, however, is in the hugeness of the task of revegetation—there are too many acres for so few hands and such little equipment and time as are available to the Federal agencies.

"Now let's consider how airplane planting could fit into this picture. The seed are mixed with pulverized soil and water, containing certain growth promoting and rodent and insect repellent chemicals. This mixing is speedily and inexpensively accomplished with a simple machine. It forms the seed pellets and dries them to prevent pre-germination, turning out about 50,000 pellets per minute. The size of the seed pellet is controlled to insure proper covering for the type of seed used, and to give the pellet sufficient mass to cause penetration when dropped by airplane. The amount of penetration is in turn controlled by the moisture content of the soil and the altitude from which the pellets are dropped.

"It can readily be seen that it is unnecessary to prepare the soil for such planting. Seed pellets will penetrate the barest spots when dropped following a rain. They will not be blown away or washed into the gullies and creeks by rain. They can be planted in areas where surface machinery could not be used, such as on slopes, high plateaus and the like."



MACHINE FOR MANUFACTURING seed pellets is important "key" to successful airplane planting. Converging wheels compress soil and seed germ mixture into small pellets, turning out thousands of them speedily and inexpensively. Dr. Adams is shown holding a model of the centrifugal planter, which "shoots" the pellets from the airplane.

Dr. Adams has a special pellet for reforestation in soil covered with mulch, such as leaves or pine needles. He uses a small, pointed, hollow-metal projectile, in which the pellet is imbedded in the open top. The metal is perforated so moisture can reach the pellet. Dropped from the air, it penetrates the mulch cover and buries itself in the soil.

Miniature "Bombs" Used

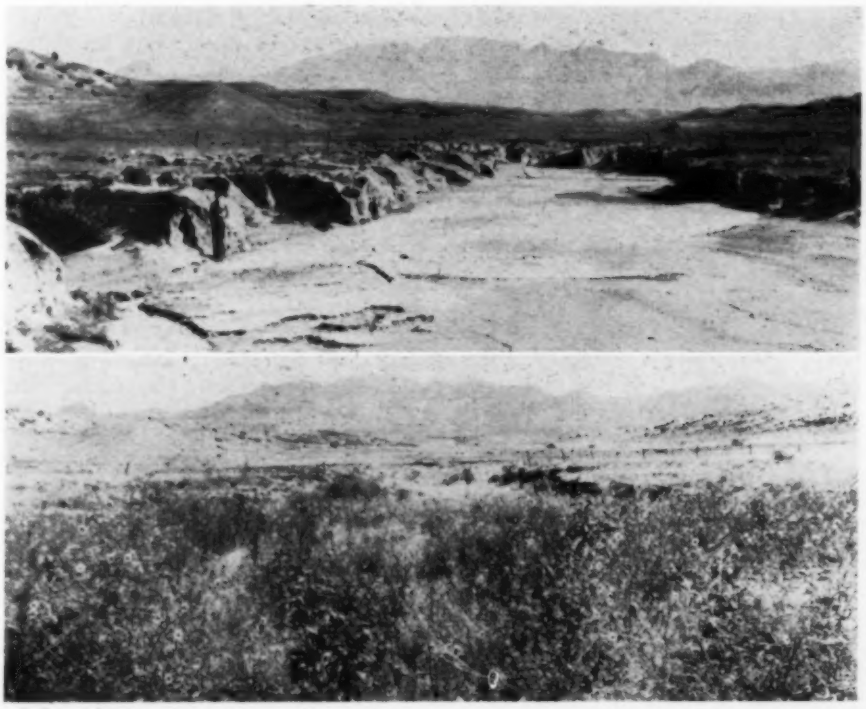
Suppose, we asked the inventor, the area to be planted does not receive enough moisture from a single rain, and rainfall is light and infrequent? His answer was that his seed pellets do not require as much moisture as ordinary seed, but if steps must be taken to "store" moisture before planting, he can do that, too.

"I have a small explosive pellet which pocks the terrain, thus creating thousands of miniature craters," he explained. "With them I can prepare the soil just before the season when infrequent rains occur, and store moisture until it is sufficient for planting."

How about row crops? He has provided for that, too: "Just turn the centrifugal planter on its side and it will shoot the pellets downward in a controllable, straight line. Or, by using a bombsight developed some years ago by Major Alexander P. de Seversky, the pilot can plant a curving row such as one following the contour of the terrain."

Dr. Adams said a company has been formed in San Diego, California,

(Continued on page 72)



BEFORE AND AFTER PHOTOS illustrate effectiveness of revegetation in preventing soil erosion, protecting watershed areas and creating growth in barren regions. Top scene shows badly eroded wash before broadcast sowing of wild seed. Bottom scene shows resultant growth after eighteen months.

Private Flying Roundup:

CAA Won't Build Plane; Price Tags for Surplus

NEW developments for postwar private flying during February centered around three major items: (1) Renewed assurances of Civil Aeronautics Administration aggressiveness for progress, (2) prospects of price-tagging and discounts on surplus lightplanes and (3) announcement of Aeronca's new two-control model.

CAA Administrator T. P. Wright completed organization of his new advisory committee on private flying, which will meet first on March 22-23 and at least once every three months thereafter to advise him on future policy. Members of the committee are from every phase of aviation. They are W. T. Piper, representing the manufacturers; John Groves, airlines; Arthur Boreman (Des Moines), consumers; Beverly E. Howard, fixed-base operators; Utah Aeronautics Commissioner Joe Bergin, state organizations; Fred Weick (Region 1), Harry Playford (Region 2), William A. Mara (Region 3), Ed Garbacz (Region 4), James C. Johnson (Region 5), Douglas Robinson (Region 6) and Ed Williamson (Region 7), representing non-scheduled aviation in general; and the following Federal agency representatives: John H. Geisse, assistant CAA administrator for personal flying development; Jesse Lankford, director of the CAB safety bureau; Fred Lanter, director of CAA safety regulation, and W. L. (Jack) Nelson of CAA, executive secretary.

CAA Not to Build Plane

Organization of the committee fits into Administrator Wright's aggressive plans for personal flying expansion. Four planks in his platform for the advancement of private flying have been described as "adequate development of airparks and landing areas; rationalization of regulations; reinstatement of a civilian pilot training program, and the development of a private flier's airplane vastly superior and less costly than any now known."

Development of a postwar private airplane superior to and less costly than "any now known" has involved the CAA in several ways, including the planned underwriting of some of the costs for research and experimental development. Some have feared the CAA might design and actually build an airplane to embody Administrator Wright's ideas, but last month CAA said it won't.

"The CAA has no intention of producing an airplane worthy of the personal airplane market," John Geisse, assistant to Administrator Wright, announced. "That is the job of the aircraft industry.

"Neither Mr. Wright nor I have any idea that the prewar airplane was not a perfectly good airplane, or that the manufacturers were charging too much for it, or that there will not be a very considerable postwar market for which these airplanes will not be entirely suitable. What we do believe and I am sure the industry shares this belief, is that the prewar airplane at prewar prices cannot attain anything approaching the mass market we envisage as potentially available. We also believe, and again I can say that there are at least some in the industry who have expressed a like belief, that it would be a dis-service to private flying and to the industry generally to sell prewar airplanes or any other airplanes to customers for whom they are not suited. Such sales can only result in dissatisfied customers, and dissatisfied customers are the bane of any industry. For those for whom the prewar airplane would not be satisfactory, new types must be developed and be developed early enough so that customers will not be induced to buy equipment not suited to their needs."

Underwriting of Experiments Planned

The CAA has estimated U. S. civil aircraft registrations will reach a total of 400,000 planes within ten years after the war. According to Geisse, the private flying industry can amount to $1,000,000,000 a year with "proper

(An Editorial)

Let's put the airplane dealer in the junk business, or get the junk dealer out of the airplane business.

New reports reached SOUTHERN FLIGHT last month concerning the continued sales, in one area, of junk under the guise of airplane material. A junk dealer buying surplus engines by the pound—$100 to $125 per ton—reportedly sold several Kinner engines at $300 to $350 each, not as junk but as engines. Kinners of the same model are sold on the recognized market at $500 to $600. The junkie may deserve a profit, all right, but what of the buyer? His "engine," which should have been smashed into metal when sold by the pound, has no record of hours or overhauls. Parts are sold the same way, and, like the engine, are still junk despite the dealer's representations. The result: Dissatisfied, if not deceased, pilots, who forget the junkie and blame the original manufacturer and aviation in general.

government and industry co-operation," pointing out that the opportunity "to establish private flying as an important industry will come immediately after the war." He told CAA regional managers that "if we do not establish private flying on a large scale in this period, and it is followed by another period of unemployment, we will have missed our great opportunity to serve our own and the public's interest."

In further explanation of the CAA's future plans, and emphasizing his statement that the CAA will not build a private plane "worthy of the market," Geisse added: "Building better airplanes at lower costs is the responsibility of the industry and our only part in this activity should be that of encouraging and assisting the industry in this undertaking. This can be done by improvements in regulatory procedure, by providing to the industry all of the information we can from our records and experiences which would be helpful to it, and by underwriting some of the costs of experimental development."

Surplus Price Tagging, Discounts

Prospects of more business-like disposal of surplus lightplanes were more promising last month than ever, and action is expected soon. The ideal method would be for the government to utilize recognized aircraft distributors, dealers and operators in making surplus lightplanes available to the public, rather than unload them on the "as is, where is" basis now used. After months of selling liaison types and trainers on bids based on ceiling prices, it now appears that price-tagging will be employed by DPC.

There are some 20,000 trainers of the PT type now going on the surplus market or soon to reach the sales yards, and plans are expected to call for tagging the best ones at about $1,700 and the poorest ones at about $700 or so, with price differentials representing the cost of necessary repairs. Further affecting the price would be a discount to the purchaser of several in one lot, say three or five airplanes. Exact figures haven't been decided on, but a 20 per cent discount is expected for quantity purchases.

Under this proposal, the "as is" policy becomes modified, and the man who pays $1,000 for an airplane knows it will cost him at least $700 to put the airplane in condition comparing with another PT of the same make and model tagged at $1,700. If he is a dealer or established operator, he knows he can buy half a dozen or more with low price tags, obtain a discount, and revive his repair and sales business at a reasonable profit. Relicensing would be required before resale.

CAA Describes Acceptable Arrangements for Twin Engines Driving Single Prop

AS a result of "considerable interest" on the part of the aircraft industry, the CAA has listed acceptable variations of multi-engine installations driving single propellers. The accompanying drawings show five arrangements which CAA believes will cover the majority of combinations to be used.

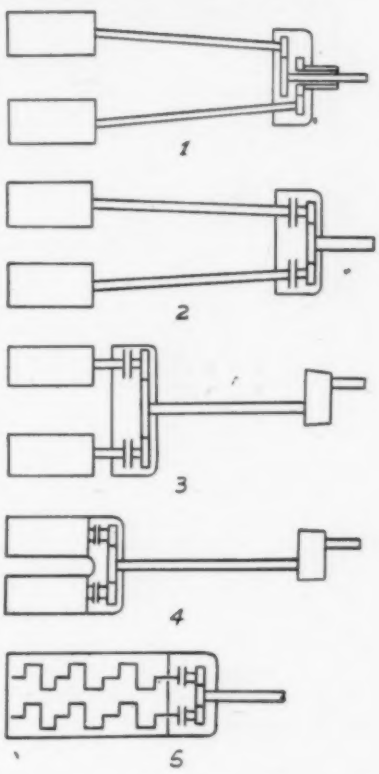
Fig. 1 shows separate engines with separate drives leading to single propeller gear box in which each drive shaft is geared to a separate propeller shaft through gear trains mechanically independent although contained in same housing.

Fig. 2 shows both drive shafts geared to a common propeller shaft. Over-riding clutches or other devices provide means by which either engine and its drive shaft can be disconnected from the system.

Fig. 3 shows short engine drive shafts leading to single gear box close to engines, with both engines geared to common propeller drive through over-riding clutches or similar mechanism. Single prop drive shaft extends to a second propeller gear box or to the propeller directly.

Fig. 4 shows common gear box bolted to engines. It is otherwise separate as regards having its own lubrication system, etc.

Fig. 5 shows two engines which are separate except they utilize a common crankcase.



Each arrangement must meet rigid requirements before final acceptance.

Record Surplus Disposal

As of February 1, 7,013 civilian type planes, out of a total of 10,180 declared surplus, had been sold and paid for, with 459 civilian types sold during January as against 861 being declared surplus during that month. Of the January sales, 251 were primary trainers. The surplus aircraft disposal record as of February 1 was as follows: Single-engine liaison, 1,584 sold and 1,246 on hand; single-engine utility cargo, 64 sold and 98 on hand; primary trainers, 604 sold, 7,519 on hand; basic trainers, 1 sold, 5,979 on hand; single-engine advanced trainers, none sold, 328 on hand; two-engine advanced trainers, 2 sold, 2,579 on hand; single-engine reconnaissance, none sold, 124 on hand; two-engine light transports, 5 sold, 1,596 on hand; two-engine medium transports, none sold and most of 187 allocated to airlines; "other" civilian types (used in War Training Service), 5,360 sold, 39 on hand; and gliders 136 sold, 836 on hand. Military types of which no sales have been made, excluding two bombers, include 1,048 single-engine fighters, 79 two-engine fighters, 887 single-engine bombers, 717 two-engine bombers, 180 four-engine bombers, 7 Kellett autogiros and 3 Culver targets.

Aeronca's "Chum"

Incorporating Ercoupe-patented features, for which Aeronca is licensed, the latest postwar plane to be announced is Aeronca's two-control "Chum." It closely resembles the Ercoupe, and specifications are as follows: Wing span, 29 feet; wing area, 140 sq. ft.; wing loading, 9.3 lbs. per sq. ft.; gross weight, 1,300 lbs.; power plant, 75 hp.; empty weight, 710 lbs.; useful load, 590 lbs.; fuel capacity, 23 gals.; cruising range, 470 miles; speed, 120-mph. top, 108-mph. cruising, 50-mph. landing; rate of climb, 650 ft. per minute; baggage, 70 lbs. ★ ★ ★

Lockheed's Jet Fighter

LOCKHEED'S newest fighter, the P-80 "Shooting Star", has been announced as the second of several new American combat airplanes powered by jet-propelled engines. The first, Bell's P-59 twin-jet, has become a trainer. Other models now in production have not been revealed, and no American jet-type has been announced as being in overseas operation.

Only scant details were released about the P-80, of which no photos or drawings are available. The Army Air Forces said the P-80 is "believed to be the fastest fighter in existence." If that is true, its top speed approximates 600 mph. or better, for U. S. and British combat airmen in the European theatre have estimated German jet fighters have approached 600 mph. in combat (see "The World's Wings", p. 76).

The Shooting Star is a single-jet model, and carefully-guarded development flights have been conducted at remote air bases. It has a pressurized cabin—the first U. S. fighter in quantity production having a sealed cockpit.

Significant Improvements

Two important developments are represented in the P-80. One is the streamlined housing of the single thermo-jet engine. Instead of utilizing a single, large air intake in the nose, such as distinguishes the British Gloster jet fighter, the Lockheed has streamlined air intake ducts on each side of the fuselage just forward of the leading edge of the wing. The turbine engine is mounted within the fuselage, and its exhaust nozzle, described as being "huge", is at the rear of the fuselage. Adding to its streamlining is a highly-polished lacquer finish, of indefinite color, to reduce air resistance to a minimum. Armament is located in the nose.

Streamlining reaches new perfection in P-80 Shooting Star

The second new development incorporated in the P-80 is its wing, described by Lockheed as being of a brand-new design. No details were provided, but the wing was called "knife-like" and extremely flat, with "other aerodynamic innovations that master the problems encountered when the speed of sound is approached or surpassed." Maneuverability is aided by hydraulic aileron boost and electrically-operated wing loading is less than that of an average fighter.

The Shooting Star's flat wing created a problem involving the location of fuel tanks, but Lockheed said it "operates over any of the ranges that conventional pursuit ships of today are called upon to perform, and thus the AAF have solved one of the major problems of design in jet-propelled airplanes." No details were given, but the P-80's large fuel supply apparently is carried mostly within the fuselage. One of the major handicaps to jet propulsion has been its excessive fuel consumption, but the Lockheed announcement indicates this has been or is being overcome.

One distinguishing feature is the location of the pressurized cabin forward of the wing. Emphasis has been placed on visibility for the pilot, and his bubble canopy combines with the plane's extremely-slender nose. The P-80 probably will see much employment in ground-strafing, or attack aviation, which requires maximum speeds. German jets have proved effective in strafing and reconnaissance.

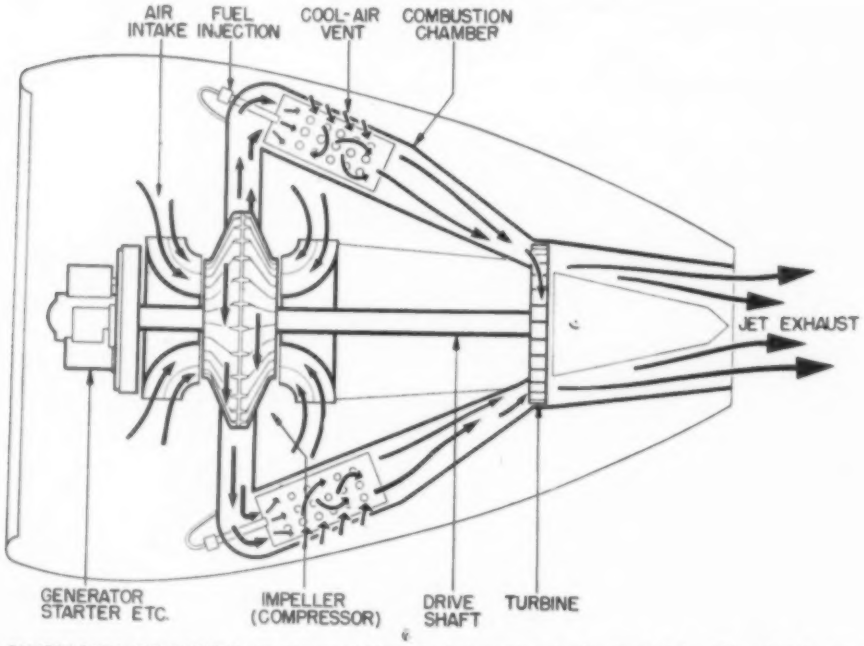
Although small and light in comparison with conventional fighters, the propellerless Lockheed is said to be capable of carrying heavy loads of ammunition, photo equipment, bombs and fuel.

Planes and Engines in Mass Production

Lockheed designed and built the first model in 143 days. In July, 1943, the AAF Air Technical Service Command furnished Lockheed a British jet engine and requested a suitable airframe. The P-80 is the result, but is powered by a General Electric turbojet instead of the British engine. Simplicity in design and construction make for rapid production, and four Lockheed plants are concentrating on Shooting Star output, with North American Aviation's Kansas City plant also engaged in its production.

Simultaneously, production of jet engines for the P-80 and other turbine-powered U. S. planes has been accelerated. General Electric has converted its Syracuse, N. Y., factory, with over 600,000 square feet of floor space, to mass production of the power plants. Allison Division of General Motors is also mass-producing the GE engine.

The new GE engine, twice as powerful as the earlier model, is described by General Electric as being "far more powerful than any conventional reciprocating engine for aircraft." That is covering a lot of ground, for the B-29 Wrights are of 2,200 hp. and there are more powerful reciprocating aircraft engines than the B-29's.



SIMPLICITY OF DESIGN in General Electric jet engine is illustrated by this sketch, released by the manufacturer. Current models are twice as powerful as those produced last year.

Maintenance Simplified

Many maintenance problems have been eliminated and others reduced by using jet engines. A jet crew chief at Wright Field has reported Bell P-59A maintenance requires "less than a fifth" of the time and labor necessary on a conventional plane.

The GE jet has only approximately one-tenth as many moving parts as the ordinary reciprocating engine. "Most mechanics are surprised to learn that there are only eleven bolts holding the engine in place," the crew chief pointed out. "In the engine there are but two main bearings and one shaft.

"I can pull an engine with an inexperienced crew in thirty-five minutes, and four men can pull both engines (P-59A) and install new ones in a day. Where we used to spend five days doing a certain job on a conventional plane, we can do the same thing for a jet in a day. Where other mechanics would use twenty-five wrenches for a certain type of job, we generally use about five."

All the equipment necessary for changing a jet engine can be carried in the plane, according to the Wright Field crew chief, whose experiences have been cited in the official magazine, "Air Force". This equipment consists of a small wing hoist and frame, and a cradle to support the engine when removed. Since the engines are so close to the ground, because of the absence of propellers, no work stands are necessary. Engine connections are few and simple, being fuel line, oil line, tachometer and generator connections, and two thermocouples leads, one to the tailpipe and one to the main shaft bearing.

The simplicity of the engine will do away with much of the mechanical tinkering which is now performed on conventional airplane engines, and it may be that jet maintenance will become a sort of refill job rather than a conventional on-the-line task. That is, explains the crew chief, "maintenance" may be done in a factory, with ground crews removing worn-out engines and replacing them with new ones.

Perhaps the simplest function of jet maintenance is servicing the plane with fuel. This is no more involved than calling the kerosene truck and filling up, but for jet engines the fuel is thoroughly filtered to safeguard the plane's barometric fuel controls. These units do what the regulator on a turbo supercharger does—they maintain a constant power with changing altitude.

Mechanics usually think in terms of complicated wiring, ignition, gauges and cylinders, elaborate fuel systems. But in the jet plane, according to the Wright Field crew chief, "everything is simple. You put in six quarts of oil, just like in an automobile."

The cooling system is just a couple of oil jets which spray lubricant and air into the two rotor shaft bearings. The oil is standard hydraulic fluid 3580. The excess runs down and forward into the accessory section, and is returned by a small scavenger pump. The system is cleaned by a Cuno filter. The generator, fuel pump and starter are the only accessories carried over from the conventional plane, and the ignition is even more simple than the oil system. There are only two spark plugs, located in the No. 4 and No. 8 combustion chambers. The other chambers are interconnected and ignite from these two. After the unit is started, combustion continues without further assistance from the plugs. Combustion is as steady as the flame from an oil furnace. Plugs last as long in the intense heat of the jet as they do in a conventional engine. In the jet their spark gap is much wider.

New Alloy in Turbine Rotors

A new nine-element alloy, called K-42-B, and developed by Westinghouse, has proved to be one of the solutions to gas turbine metallurgical problems. Its quality of toughness at red-hot temperatures of 1,200 degrees Fahrenheit and resistance to the centrifugal stresses which try to pull the speeding gas turbine rotor apart with a force equal to 50,000 times its own weight, have played a large role in bringing gas turbine engines to the practical stage, according to Fred K. Fischer, a Westinghouse engineer.

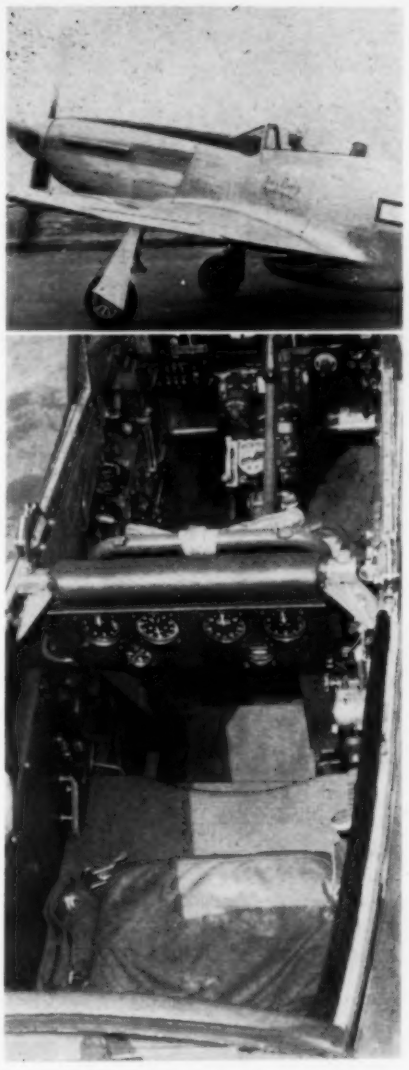
Fischer has brought out an interesting comparison of gas turbines with reciprocating engines, emphasizing the advantages offered by the turbine's compactness and small size. Units of very high power can be packed into a small space, he said, greatly reducing air resistance.

"This makes it possible either to use lower-powered engines, or to get more speed out of planes equipped with turbine engines as compared with reciprocating engines," he explained. "At 500 miles an hour a conventional reciprocating engine expends up to half its total horsepower merely to drag itself through the air, so at that speed a 2,000-horsepower engine can apply only 1,000 horsepower to driving the plane.

"A gas turbine engine of comparable power would have a frontal area only one-quarter as large, and therefore would require only 250 of its own horsepower to move itself through the air. Seven-eighths of its total power, or 1,750 horsepower, could be applied to driving the plane."

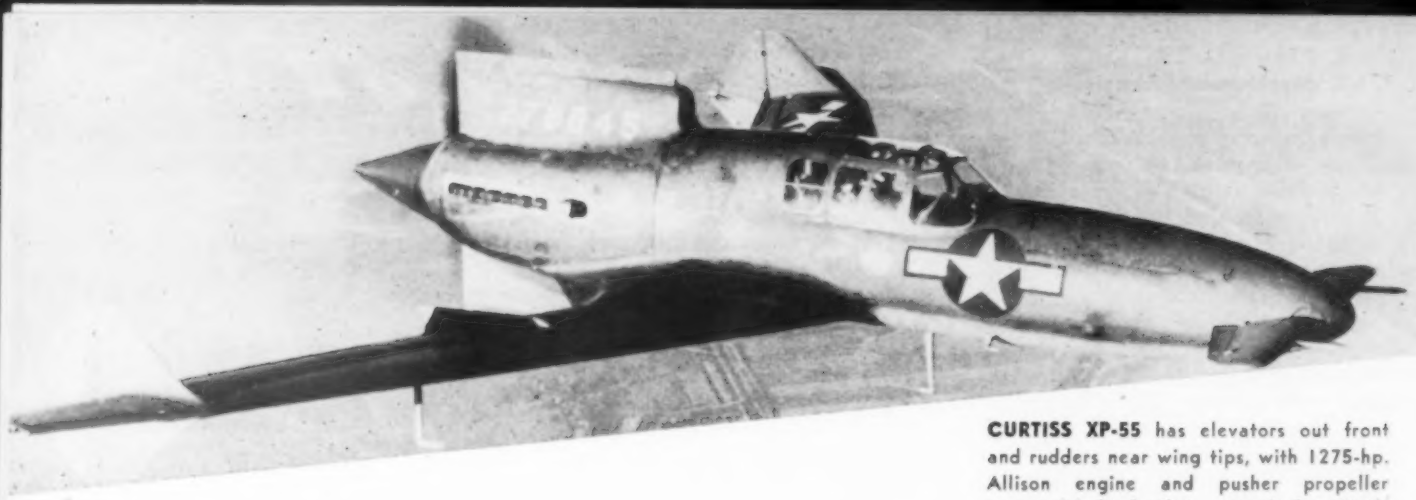
Hall Hibbard, chief engineer of Lockheed, declares it is "hard to forecast the limits of future developments" in jet propulsion. "In my opinion," he said, "jet engines can be used successfully by large planes as by small. I can foresee tremendous increases in transport speeds in a matter of a very few years. Jet engines remove the barriers formerly limiting the top speed of aircraft, and we should see airplane speeds passing through the compressibility range (approximately 725-775 miles per hour at sea level) in a relatively short time. ★ ★ ★

Two-Place P-51



—(North American Aviation Photo.)

With radio equipment removed, special P-51 Mustangs are being outfitted with rear seat and flight-instruments for carrying engineers and other technicians aloft. The added seat has ample room for passenger to wear a parachute and a "Mae West". General Eisenhower was flown behind the German lines in France last summer in a Mustang so equipped. Instruments on rear panel include a tachometer, manifold pressure gauge, altimeter, clock, airspeed indicator and oxygen blinker.



CURTISS XP-55 has elevators out front and rudders near wing tips, with 1275-hp. Allison engine and pusher propeller mounted behind pilot. Army's first "tail-first" design, its propeller is jettisonable.

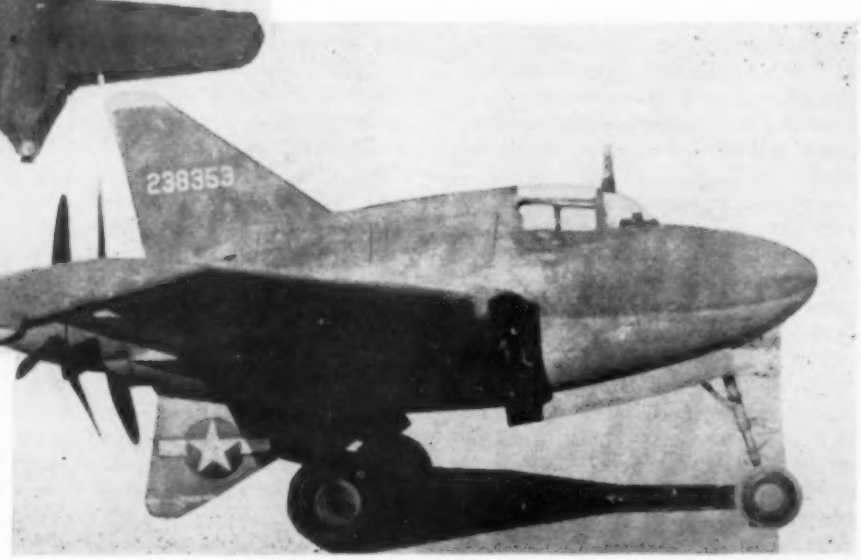
FIGHTER *Freaks*

THE Army Air Forces' never-ending search for combat airplane improvements has wrought many changes in design, especially in fighters, which have involved more experimentation than any other type. Secrecy was recently removed from some of the more startling experimental models which were revealed for the first time—but only after exhaustive testing had shown most of them unsuited for combat. Nevertheless, the unveiled fighter freaks have served a valuable purpose, for from them are coming practical development which will appear in action from time to time.

The planes pictured herewith represent the cumulation of many causes and changes in design through years of research. Usually only one or two models were made before the ideas they embodied were so modified as to leave the original model a dim memory in some technician's mind. These are the "radical new secret weapons" about which so many rumors were circulated from time to time. They aren't the latest or the last, for newer ideas are being brought to Wright Field in an unending procession.

Remember the rumor of a year ago about a queer-looking fighter which

NORTHROP XP-56 is Army's first "flying wing" fighter (below). Its single radial engine, mounted behind pilot, drives two three-bladed counter-rotating pusher-type propellers. Both elevator and lateral controls are located at wing tips.



McDONNELL XP-67 (above) utilizes turbo-exhaust for jet thrust in addition to propeller thrust from twin supercharged and powerful Continental in-line engines. Although it has a tail section, wing and fuselage construction resembles modified flying wing.

VULTEE XP-54 is twin-boom pusher, powered by in-line Lycoming engine. It was made primarily of magnesium to reduce weight, and has an electric elevator to lower the pilot seat and facilitate entering and leaving the cockpit. "After a long take-off, ship flew fairly normally," said AAF.

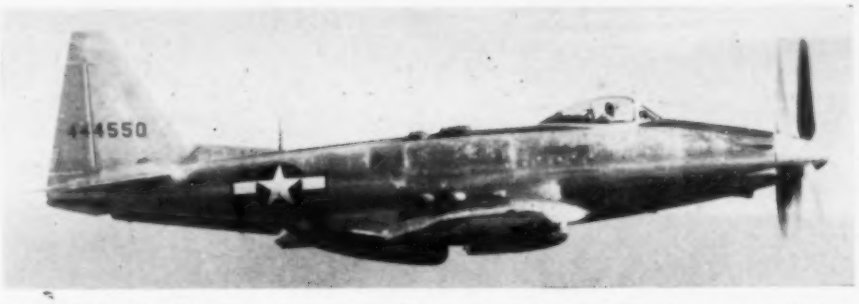
(All photos by Army Air Forces.)

"flew from St. Louis to Chicago, or somewhere else, in so many minutes?" It was the McDonnell XP-67, shown on the opposite page. Among its faults was take-off difficulty. Also shown here is the famous flying wing fighter you've heard so much whispering about. It's Northrop's famous XP-56. While this model might be questionable, nobody doubts its future possibilities, and it is one of the most promising of the freak designs.

Of all the unconventional designs pictured here, the least "startling" or freakish is the small plywood Bell XP-77, shown at the bottom of this page. It is the Army's first all-wood fighter of less than 4,000 pounds weight, and it reportedly draws a top speed of about 400 mph. from its 700-hp. aircooled, in-line Ranger engine. Conceived as a possible answer to the agile Zero, it developed several shortcomings during testing, but it opens the way for postwar lightplane designs in the high-performance category.

One of the most revolutionary fighter designs is the Curtiss XP-55, the "tail-first" development which was the subject of so much hush-hush rumor until the AAF revealed it would not go into quantity production. Its engine is mounted behind the pilot and its elevator controls are mounted in the extreme nose, with rudders near the ends of its swept-back wing. To bail out, the pilot would have to jettison the propeller with a "kick-off" control. Curtiss claims its advantages include improved forward visibility, increased rudder effectiveness for recovery from spins, better ground-handling characteristics, and better high-speed flight handling characteristics because the elevators, being in front, are removed from the compressibility wake of the wing. Its performance details are still restricted.

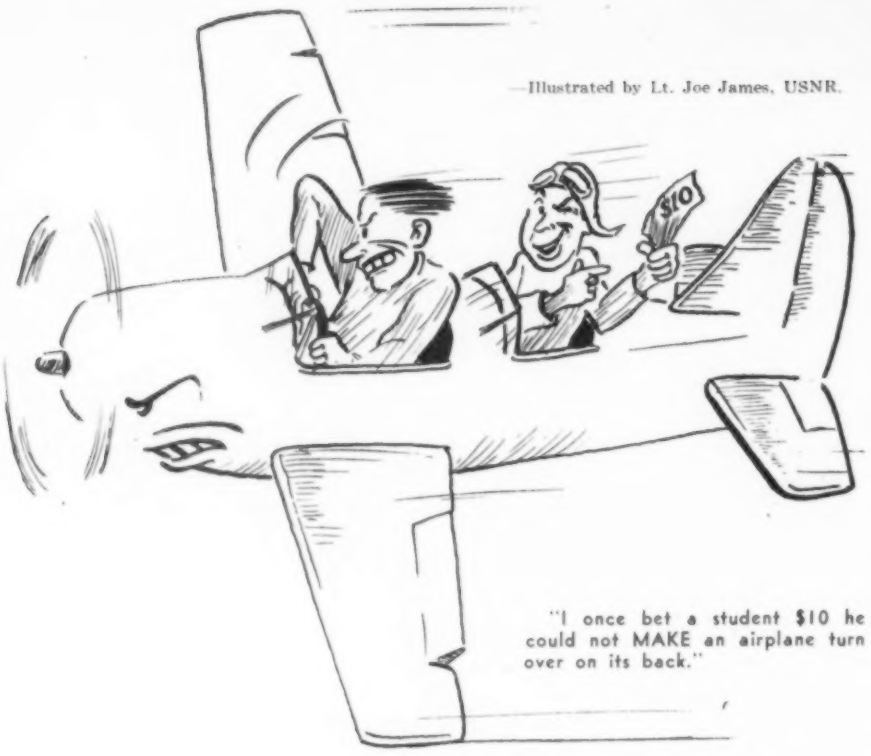
★ ★ ★



FISHER BODY XP-75 was a composite of the P-51 fuselage, P-40 wings and A-24 tail, powered by double Allison engine producing 3,000 hp., and equipped with an Aero Products contra-rotating propeller. But dissimilar parts didn't work together and the above modified design resulted, with engine behind pilot. It was too heavy.

GRUMMAN XP-50 was developed several years ago and crashed, after which the project was dropped. It was armed with twin 50-cal. guns and two 20-mm. cannons.

BELL XP-77 appeared to be match for highly maneuverable, lightweight Zero, but its tactical performance was lacking in several respects despite exceptional high speeds from its 700-hp. Ranger engine. It has been proposed as a fighter-trainer, and has postwar possibilities.



—Illustrated by Lt. Joe James, USNR.

"I once bet a student $10 he could not MAKE an airplane turn over on its back."

CONFESSIONS *of a Flight Instructor*

PART V

By A. H. KNOUFF
Lt., A-V (T), USNR*

I ONCE bet a student $10 he could not *make* the airplane turn over on its back. That sawbuck certainly came in handy.

It was an extreme cure for an extreme case of the most common cause of errors in turns. Most people are not conscious of the fear that the airplane will turn all the way over and dump them out, but it is a rare bird who does not try to keep his body perpendicular to the ground the first time he makes a turn in the air. Most of them realize that it is more natural to lean with the airplane when you point out to them that they instinctively lean toward the turn when riding in an automobile, or even while walking. My student was an ex-cowboy. He got the idea when I reminded him that on horseback it was natural for him to remain perpendicular to the horse, rather than the ground; but his mind could not convince his muscles that it takes an expert to put an airplane on its back, until I had won my bet.

Be sure of your student's nerve before you try any such last resort, or you may lose him.

Trial and Error

The most common result of leaning away from the turn is a skid. When the student leans, he takes the stick with him. The airplane starts to roll out of the turn, and he tries to keep it turning by applying more rudder. I don't have to tell you what happens if this is carried to the extreme.

Whenever a beginner skids, check and correct the position of his body first. If the skid continues after he is apparently sitting straight in the airplane, tell him to take his feet off the rudder pedals. The airplane will start to roll out of the turn but, since his feet are not on the rudder, he will have to hold it in the turn by means of aileron. After you have shown him this, you can explain it.

The natural stability of the airplane makes it want to do the right thing. The angle of bank is the most important factor in establishing a turn—increasingly so as the turn gets tighter and the bank steeper. The rudder is used mostly to keep the airplane from slipping while entering the turn.

Slipping is a less common error—and less likely to have dangerous results. It can be corrected in the same manner as the skid. The mechanical cause is the reverse of the skid—holding outside rudder, and inside aileron. The mental cause is similar to that of the skid—tenseness resulting in failure to relax on the controls after the turn is established.

When I say that a slip may be caused by holding inside aileron, I mean it relatively, of course. The ailerons may actually be in neutral. The outer wing tip will have more lift because it is moving faster than the inner wing tip. Theoretically, in any turn a pilot has to hold slight opposite aileron pressure to keep the turn from becoming tighter or the plane from slipping. This is quite noticeable in gentle turns, which is one reason for teaching medium turns first.

I don't like to tell a beginner about this over-banking tendency. He will usually correct it instinctively, and if it is called to his attention, dangerous skidding habits may result. In early lessons, I don't scold much about mild slips. But be sure your student is cured of skidding before you solo him.

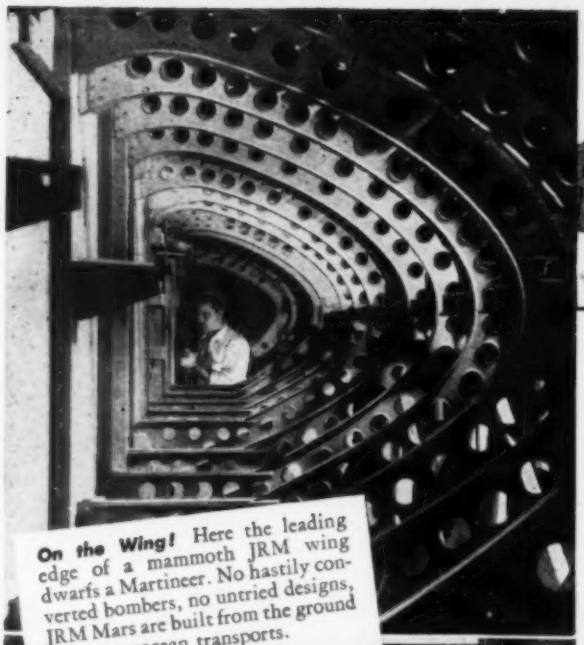
Lift and Nose Position

The third important error is allowing the nose to drop. This is due to the lift of the wings being at an angle, instead of directly opposed to gravity. One way to think of this is that part

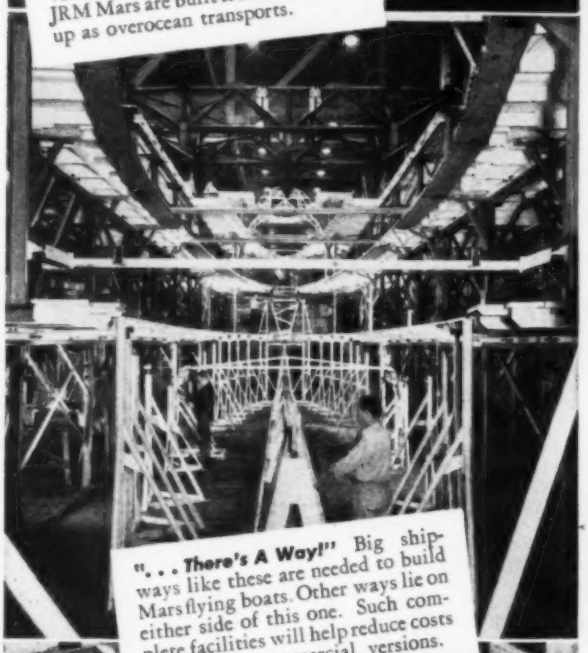
(Continued on page 42)

"Part of the lift is being used to overcome centrifugal force or pull the airplane around the turn."

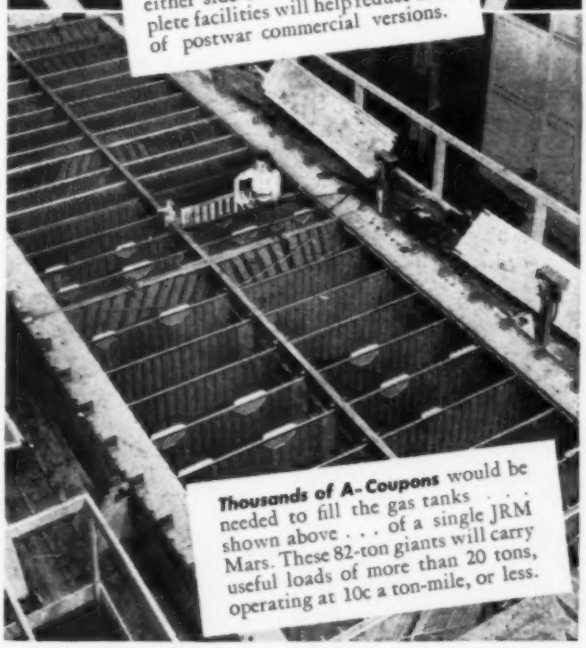
*Opinions and assertions herein are the author's, and are not to be construed as official or reflecting the views of the Navy Department or the naval services.



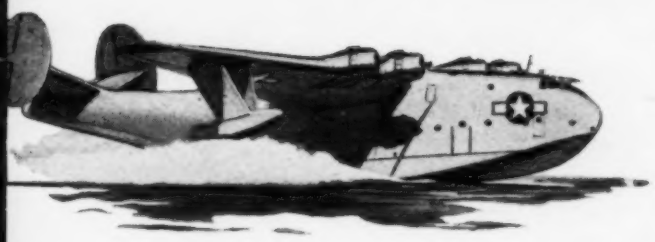
On the Wing! Here the leading edge of a mammoth JRM wing dwarfs a Martineer. No hastily converted bombers, no untried designs, JRM Mars are built from the ground up as overocean transports.



"... There's A Way!" Big shipways like these are needed to build Mars flying boats. Other ways lie on either side of this one. Such complete facilities will help reduce costs of postwar commercial versions.



Thousands of A-Coupons would be needed to fill the gas tanks . . . shown above . . . of a single JRM Mars. These 82-ton giants will carry useful loads of more than 20 tons, operating at 10c a ton-mile, or less.



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IN a year of service with the Navy the Martin Mars has demonstrated convincingly her outstanding performance characteristics. She's carried useful loads of over 35,000 lbs.—flown non-stop 4,227 miles—operated, under war conditions, at 15c per ton-mile. But sensational as her performance has been, there's another and equally important fact that recommends Mars-type transports to overocean airline operators.

Prompt Postwar Delivery

Airlines ordering commercial versions of the Mars, when Victory finally comes, will have no long wait for designing, tooling, testing and ironing out "bugs." Martin assembly lines are fully tooled *today*, for production of 20 more Mars transports for the Navy. Moreover, a year's service has thoroughly tested the Mars, yielding developments which are being incorporated in her 20 sisterships. Result: prompt delivery of Mars transports, which will permit airlines ordering these planes to "get the jump" on competition.

Write for Information

Orders for commercial versions of the advanced Mars are now being taken for postwar delivery. Companies currently in overocean air service or planning such service after Victory may obtain complete information about the Mars from the Glenn L. Martin Company, Baltimore 3, Md.

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LUSCOMBE AIRCRAFT CORPORATION, TRENTON 7, NEW JERSEY

FLIGHT INSTRUCTOR

(Continued from page 38)

of the lift is being used to overcome centrifugal force or pull the airplane around the turn. Since the airplane weighs just as much as before, the total lift must be increased enough so that the part that is directly opposing gravity is equal to the lift that was being used before the turn started. The additional lift is acquired by increasing the angle of attack. The angle of attack is increased by applying back pressure to the stick.

There are many equally correct ways of explaining this phenomenon. All of them say essentially the same thing. The one I have described has proved effective with most of my neophytes. Whatever you do, make it sound simple but complete. Later, when he questions you on the ground, you can go into the subject as fully as his inquiring mind requires — or your vocabulary and knowledge permit. Don't be embarrassed if you can't answer all he asks. I don't think scientists have yet decided which came first —the chicken or the egg.

Most students will hold the nose too low in left turns and too high in right turns, even in tandem-seat aircraft. This is due to the effect of torque. In any turn, the speed will be less in relation to the power used than it is in level flight. Whenever this occurs, the trim forces are thrown out of balance and the aircraft will move to the left around the vertical axis. Thus it is always necessary to use more rudder in entering a right turn than a left turn. In steep turns it *may* be necessary to hold right rudder. This is not always true, and you might spin out of a "right" vertical by holding too much rudder when you should have increased the bank or "loosened up" the turn. It is just one of those things that makes turns an inexhaustible topic for hangar flying.

Side-by-side airplanes produce the well-known optical illusion that the nose looks higher in a left bank than a right bank. In spite of the criticism of such airplanes for this reason, I have found that calling a student's attention to this illusion and showing him the correct attitude of the nose in a turn each way, just once, is usually sufficient.

Ailerons vs. Rudder

I sometimes tell a beginner to start a turn with aileron and stop it with rudder. I had no idea how far this expression had spread—and probably been misunderstood—until CPT issued a bulletin against it. This bulletin insisted, quite properly, that the student should be taught to co-ordinate all the controls in a turn. The phrase I use is, of course, merely a device which gets a desired result quickly. It is not intended to mean that one control is used before the other, and is not interpreted that way by most students. Even if it is interpreted literally, however, part of the instructor's object will be accomplished. A student who starts turns with aileron and stops them with rudder will not spin out of one.

The idea that I really want to get across is that, in any maneuver, one control will establish the pattern and determine the amount of other controls to be used. I call this the *dominant* control. In a turn, the degree of bank determines the pattern of the turn. The amount of aileron and length of application determines the degree of bank. Therefore the aileron is the dominant control, and rudder is applied as needed to prevent slipping or skidding.

Then why isn't the aileron the dominant control when stopping a turn? The principal reason is safety. If the ailerons dominate the recovery from the turn, and rudder-co-ordination is slow, skidding will result — and possibly a spin. I have flown one popular make airplane which will spin out of a turn if too much aileron is applied in the recovery.

Explaining all this to a student the first time he tries turning an airplane is likely to make him dizzy. That is why I tell him to start his turns with aileron and stop them with rudder. The second time I may tell him to "lead" with aileron to enter a turn, and "lead" with the rudder to recover. This comes a little closer to the real idea. Then I feed him the follow-up explanation in installments as fast as he can take it.

Co-ordination means doing several things at the proper time and in the proper amount in relation to each other. It does not mean applying rudder and aileron at the same time and in the same direction. A slow roll requires about the highest degree of co-ordination; yet throughout most of the maneuver the controls are applied in opposite directions and the amount and timing are highly complicated. That's why I won ten bucks.

I seem to be back where I started —which might have been expected when we started on the subject of turns. We have really only scratched the surface of the subject. Whenever you get into a discussion of turns, you will find the argument going in circles —and discovering something new each time you go around. ★ ★ ★

"It is a rare bird who does not try to keep his body perpendicular to the ground the first time he makes a turn."

MODERN AIRPORTS

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Albert Whitted Municipal Airport
St. Petersburg, Florida

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Fraudulent Gas Taxes Should be Eliminated

By JOHN R. WEST
President, West-Marquis, Inc., and National Counselor for National Aeronautic Association.

When I was asked not long ago to discuss the aviation gasoline tax problem before the recent California Aviation Conference, I cautioned that that was a sore subject with me. But I believe that the subject badly needs a general airing. So I spoke then, and so I write now, glad of the opportunity, hoping that public attention may be drawn to the vicious mess of aviation taxation before it does serious damage to a tremendous but still young industry; and that that attention may result in a change in the existing tax set-ups, to the benefit of aviation, commercial and private, and to the country as a whole.

EVERY state in the Union, with the exception of North Dakota and North Carolina, which completely exempt aviation fuel from taxation, is indulging in a sort of good-natured theft. They are draining millions of dollars annually out of aviation and using that money for any purpose that suits their fancy, but seldom returning any of it in the form of benefits for aviation. My own state, California, whose future prosperity is perhaps more dependent upon a healthy and developing aviation industry than any other, has been collecting personal property taxes on airplanes and levying a 3c per gallon tax on aviation fuel since 1923. Hundreds of thousands of dollars have poured into the state coffers.

Let us examine the present taxation set-up. Then let's project its effect on postwar aviation. The great damage that can be done, if the situation is not changed, will be obvious.

In 1941, the latest year for which full figures are available, nearly $8,000,000 was paid to the Federal and state governments by the tax on aviation gasoline. Of that amount $2,272,783 was collected by the government through its 1½c tax. With that I have no quarrel. A tax on airplane gas is just as fair as one on automotive fuel, and Washington does pour money into aviation projects, although not specifically the money collected by the gasoline tax. But nearly five and one-half million went to the individual states in taxes varying from 2c to 7c per gallon—and very little of it was returned to aviation in any form. The latest summary of state aviation fuel taxes and their disposition is shown on the opposite page.

"Gentle Robbery"

Some states work a "blind" for grabbing money known as the refund system. That trick might be ridiculous if it weren't so expensive to aviation. The aircraft operator buys his fuel, pays his tax, and then is eligible to receive part or all of it back, providing he fulfills requirements which have almost as many variations as there are states. That looks honest enough, but its practical workings amount to gentle robbery.

As far as the commercial airlines are concerned, they get their refunds. It pays them to do so, but it also costs them a good chunk of cash in time and bother to go after it—to say nothing of the time consumed by the tax-supported government clerks who must handle these rebate transactions.

But it is the private aircraft operator who really takes the shellacking. He, of course, is entitled by law to a refund on the tax he has paid in certain states. But it is so much trouble, so expensive in time to get it, that he seldom does. Thus the states acquire that money by default.

As illustration, let me take you on a trip I recently made from Los Angeles to Fresno, California, then to Las Vegas, Nevada, over to Albuquerque, New Mexico, and back through Phoenix, Arizona.

At the Fresno Municipal Airport, built by the city and Federal government, I purchased gas and got a receipt from the Standard Oil station. In Califonia I am entitled to a refund of 3c on each gallon, providing I fill out a certain form and send the pink or blue copy of the Standard Oil receipt to Sacramento. When I gassed up with Texaco at the privately built Alamo airport at Las Vegas, I was handed a different kind of a receipt—and in that state I have to use a purple copy and another form, duly sent to their state capital, to get a refund of 4c per gallon. Over at Albuquerque it was not as nice; I paid 5c a gallon tax for buying fuel at an airport built by CAA funds. I don't have a chance to get back a cent unless I buy fifty gallons or more. It so happens that my Ercoupe thoughtlessly holds only twenty-five gallons, so I paid New Mexico $1.25 tax, whether or no. When down at Phoenix, again using an airport largely built by CAA funds, I received a yellow copy of the receipt from the Shell dealer. I can send it with another type of form to their capital and get back the 5c per gallon tax. I didn't . . . it was just too damn much bother. The form required by Arizona reveals the final twist to the kitty's tail: Each refund request filed for each state has to be notarized.

Why Penalize Progress?

When I returned from that trip I called thirty private airplane owners around Los Angeles just to see what they did about this rebate business. One man regularly filed for his refund in California—he didn't in other states; eight others had done so once, and never did again because at 10c an hour for their time it cost them more money to perform the paper work than the tax was worth. The other twenty-one had taken a good look at the red-tape involved, said "what the hell" and had never filed. It isn't difficult for the states to make such a nuisance of the refund method that it becomes a mockery . . . and an easy source of revenue.

Some states don't kid anybody about their intention of keeping the tax . . . for any purpose that their legislators feel needs a bit of priming. It must be pointed out in fairness that some of them do have what is vaguely known as an "aviation fund". But glance at Rhode Island: 3c a gallon tax and it goes into that great anomaly, "General Fund". Pennsylvania takes 4c and puts it into highways and relief; Alabama and Georgia get 6c on each gallon and use it for education and roads. Louisiana makes off with 7c a gallon. For airstrips? No, for highways.

Some of these states do consider refunds but with such finesse that the private flier has the door gently slammed in his face. Kansas will give him back its 3c tax if the purchase is over forty gallons, like New Mexico and its fifty gallons requirement. Kentucky will refund a 5c tax to commercial interstate operators providing they deposit $1,000 bond and make their request before the 15th of the following month. Fifty per cent of its 4c tax can be squeezed back out of Wyoming if 10,000 gallons or more is bought in one month in that state. Florida offers to return its 7c tax if the gasoline is 78 octane or more. And so on with delightful variation. There is nothing dull or boring in a cross-country flight when it comes to purchasing the fuel with which to make it.

All this merry-go-round adds up to quite a serious situation. Actually the private operator who never gets his refund or just pays an outright tax with no rebate considerations,

isn't out such a lot of money individually. And one might ask why all the fuss about the states taking it if the money involved isn't worth the trouble of getting?

It isn't just the dishonesty of the whole set-up—that of the states taking the money under one pretense or another and giving no return for the taxing. It isn't the principle involved that makes the rub. It concerns the progress or retarding of the whole future of aviation, both commercial and private, in this country.

Suggestions for Improvement

Aviation needs that tax money desperately for its own purposes to keep on expanding and growing.

In 1941, with about 20,000 privately owned planes in the air, the states taxing aviation gasoline collected nearly five and one-half million dollars. The aviation industry expects 500,000 private planes to be flying within ten years of the war's end. If the tax system remains unchanged, about $137,500,000 will be going to the states.

Aviation urgently needs that money ploughed back into a national development program for itself . . . not sunk silently into the various states' highways, relief projects or general funds.

Air authorities estimate that, in order to support the vastly increased ownership of private planes in the immediate postwar period, thousands of landing facilities will be needed. The country has less than 3,000 airstrips, airparks, and airports now open to private flying. The cost of that program of landing facilities will be close to one and one-half billion dollars. If those facilities are not built, private flying may be a puny child for many years to come—and the country cannot afford to allow a vast new field to languish in that fashion. Surely it is logical and just that the taxes aviation pays on its fuel be returned for its badly needed development, which in turn benefits the country as a whole.

The individual states should not be assessing taxes on aviation gasoline at all, let alone indulging in such patent absurdities as a range in tax from 2c to 7c and with all the fancy methods of taking it piled on top. Aviation is not tied to the ground nor can it justly be limited by state boundaries. Its speed and mobility automatically shifts any taxation upon it into the realm of the Federal government. That body, and that body alone, should assess uniform taxes on aviation fuel, and the money thereby accumulated should be used for the further development of aviation and the building of facilities necessary to it.

The states, of course, will benefit as units from the development of aviation. They should, therefore, help support it. And the funds with which they should do that could justly be derived from aviation. But it should not be collected in fuel taxes or a tax on airplanes as "property". Aircraft should be taxed by the states as automobiles are—by a uniform system of registration and licensing fees. And the funds thus accumulated should be allocated by the states for aeronautical development.

Likewise, local communities should understand that they must contribute some part of the cost of building landing facilities. Communities in which aviation is a part will benefit from it. They should invest towards the increase of those benefits.

That is what aviation taxation **should** be. It cannot be that until the existing state laws are changed or repealed. We must be on guard that the state legislatures do not pilfer the pockets of private and, in a smaller measure, commercial aviation to the point where the growth of this vast new industry is stunted. Over one and one-half billion dollars in automotive fuel taxes has been lost to the highways of America in the last twelve years through our state legislators' game known as "diversion of funds". That is enough to build eleven super highways from Los Angeles to New York. The same thing could quietly happen to aviation tax money, if the tax on its fuel remains in the hands of the state legislatures. That might well be disastrous to young aviation.

★ ★ ★

Aviation Gas Taxes by States, January 1, 1945.

EXEMPTIONS, REFUNDS, DISPOSITION

(Prepared from Air Transport Association Data)

TOTAL RELIEF: Arizona, 5c, refunded; Arkansas, 6½c, exempt; California, 3c, refunded; Colorado, 4c, refunded; Connecticut, 3c, refunded; Delaware, 4c, refunded; Florida, 7c, exempt; Illinois, 3c, refunded; Indiana, 4c, refunded; Iowa, 3c, refunded; Kansas, 3c, any amount exempt if placed in fuel tanks by airport management holding state exemption permit, and owner holding such permit may buy from licensed distributor in quantities of 40 gals. or more tax exempt; Kentucky, 5c, refunded on gas used in interstate commerce on filing $1,000 bond before applying for refund and filing claim before 15th of month for fuel purchased preceding month and conforming to other statutory requirements; Maryland, 4c, refunded; Massachusetts, 3c, refunded; Minnesota, 4c, refunded but unclaimed refunds are expended in support of state aeronautics commission; Missouri, 2c, refunded; Montana, 5c, refunded; Nevada, 4c, refunded; New Hampshire, 4c, refunded but unclaimed refunds support state aeronautics activities; New Jersey, 3c, refunded; New Mexico, 5c, refunded on 50 gals. or more purchased at one time through registered dealer, with minimum refund being allowed on 100 gals. and refund limited to four months from date of purchase; New York, 4c, refunded; North Carolina, 6c, exempt if used exclusively in aircraft engines; North Dakota, 4c, exempt to holders of license to purchase gas through registered dealer; Texas, 4c, refunded; Virginia, 5c, refunded 5c per gal. on gas used outside of state and refunded 2c per gal. on gas used within state; Washington, 5c, refunded to established air transports, authorized flying schools and airplane manufacturers but individual airplane owners pay tax and apply for refunds; West Virginia, 5c, refunded on quantities of 25 gals. or more; Wisconsin, 4c refunded; District of Columbia, 3c, refunded.

PARTIAL RELIEF: Michigan, 3c, 1½c refunded for interstate usage only, 1½c retained for aeronautics fund; Mississippi, 6c, 5c refunded, 1c retained for highways; Ohio, 4c, 3c refunded, 1c for general revenue fund; Oklahoma, 5½c, 4½c exempt, 1c for general revenue fund; Oregon, 5c, 4c refunded, 1c retained for aeronautics; Wyoming, 4c, 2c refunded on purchases in excess of 10,000 gals. per month, 2c retained for city or county airfield maintenance where tax collected.

NO RELIEF: Alabama, 6c, used for highways; Georgia, 6c (no tax on gas used in U. S. flight training when purchased by U. S. agency), used for highways and education; Idaho, 5.1c, 2½c for aeronautics fund; Louisiana, 7c, 5c to highway fund, 2c to education, Port of New Orleans, Port of Lake Charles, and other public purposes; Maine, 4c, aeronautics fund; Nebraska, 5c, 80% to aviation fund, 20% to state assistance fund; Pennsylvania, 4c (U. S. Government exempt), highways and relief; Rhode Island, 3c, general fund; South Carolina, 6c (refunded on gas used in U. S. primary training), aviation fund; South Dakota, 4c maintenance of airports where tax collected except in case of air transport tax which is divided proportionately among airports; Tennessee, 7c, aviation purposes; Utah, 4c, aeronautics fund; Vermont, 4c (3c refunded on use in U. S. flight training), $6,000 to aeronautics fund. ★ ★ ★

IDEAL FACILITIES FOR POSTWAR BUSINESS are found at Curtiss-Parks Airpark six miles from downtown St. Louis. Unobstructed all-weather runways are matched by modern merchandising methods used by Parks Aircraft Sales & Service.

Model Airpark Facilities for Sales and Service

By WILLIAM M. THOMPSON
Vice President and General Manager
Parks Aircraft Sales and Service
Curtiss-Parks Airpark, East St. Louis, Ill.

JOHNNY Q. PUBLIC is expecting great things in aviation development after the war, and if those who have pioneered in aviation do not change their prewar methods of merchandising, people who have not heretofore paid a great deal of attention to the future of aviation are going to take over. I particularly refer to that group who have catered to the public and know what the public wants — men and women who know and practice good merchandising principles.

Parks Aircraft Sales & Service, headed by Oliver L. Parks, president of Parks Air College, has established a well-knit organization that will operate in eight states in the Middle West. This organization will distribute the Ercoupe airplane and accessories, parts and other aeronautical supplies. Bases of operation will be established in Indianapolis, Indiana; Chicago, Illinois; Kansas City, Missouri; East St. Louis, Illinois, and Tuscaloosa, Alabama. Through these five distribution bases will be served thirty-four retail dealers.

In order properly to merchandise the products that we are going to distribute they must be displayed appealingly to our prospects. At the East St. Louis base is established a most modern airpark beautifully landscaped with facilities to distribute aeronautical equipment and maintain all types of aircraft.

LUXURIOUS LOUNGE ROOM makes the Curtiss-Parks Airpark a country club of the air. Wide plate glass windows give a clear view of the field.

The Airpark

The East St. Louis operating base will be at the Curtiss-Parks Airpark located six miles southeast of downtown St. Louis and four miles south of downtown East St. Louis. Our customers go from the airport to the leading hotels in downtown St. Louis in fifteen minutes. There is hourly bus service past the airpark—at a total fare of thirty cents, round trip. We will inaugurate station wagon service leaving the airpark every half hour to the leading hotels in St. Louis just as soon as it is possible for us to obtain the equipment.

There are three concrete runways 100 feet wide and 1,600 feet long plus an extension of 2,000 feet of blue grass sod that is adequate even in inclement weather. The entire field includes 568 acres of which 400 acres are available for landings and take-offs. There are four large hangars and a recreation building located on the field. These hangars have trowel-

led concrete floors and glazed tile interiors.

Recreation Room

As you approach the Curtiss-Parks Airpark, you will be impressed by the landscaping at the entrance and along the winding drive that takes you to the large shaded parking area on the southwest side of the recreational building. Upon leaving your car you will pass over a large concrete patio marked off for badminton and shuffleboard.

Entering the lobby of the recreation room overlooking the patio, you will enter a room finished with a very pleasing color scheme and the walls decorated with paintings of Air Forces fighting planes. The handmade rustic furniture is inviting and you immediately feel at home. There are bookcases filled with the latest best sellers, fiction and non-fiction and a complete library of technical books and current magazines. A ladies' powder room is provided with dressing tables, rugs, chaise lounge and other niceties.

In the game room are card tables, music boxes, pinball machines and other recreational facilities.

A locker room for men and a locker room for women have been provided. Every permanent storage customer at the Curtiss-Parks Airpark will have his own private locker. A log room has been provided for transient pilots and those who make the Curtiss-Parks Airpark their home base. Here they can bring their log books up to date, plot their course on a large map table, get weather information which is posted twice daily on the bulletin board and correct their maps from a master map of the United States. This map, we believe, is an innovation in that it incorporates all the regional maps of the United States placed together to form a single large map of the United States.

Also included in the recreation building is a modern snack bar where sandwiches and light lunches will be served. A contemplated development will be a modern swimming pool and a high-class restaurant serving the finest steaks and sea foods.

Showroom

Upon leaving the recreation room the visitor enters the administration building and showroom. The showroom comprises an area of 100 by 120 feet. The floor is finished in red, waxed and highly polished. A variegated colored back drop to set off the display airplanes to advantage is provided on the rear wall. We will display five airplanes in the showroom, spotlighting the center airplane which will be mounted on a platform. Along the two walls of the showroom will be display facilities for aircraft accessories, supplies and parts. The entire display is being designed by the Goodyear Tire and Rubber Company, long recognized in the automotive field as one of the foremost merchandising organizations.

IN THIS COMFORTABLE LOG ROOM fliers record their time, study regional maps of the United States, shown at the left, or participate in blackboard drills supervised by the chief flight instructor.

Repair Station

Our repair and overhaul shops are housed in a hangar 100 by 120 feet with a twenty-foot lean-to and upper deck. The shop is laid out in departments designed for maximum efficiency. Sufficient tools and equipment will be available to service all types of aircraft, engines and accessories. Realizing the importance of speedy first class service, we are adopting an exchange service policy on engines and other parts and accessories of the Ercoupe airplane. This service will be offered at each of our five bases as well as our thirty-four dealers. To illustrate how this system will work, let us assume that Mr. Jones comes in to anyone of our dealers or main bases with a malfunctioning magneto on his engine. If after a check, it is determined that it cannot be repaired and put back into service within forty-five minutes to an hour, we will install an overhauled magneto, charge him a flat rate for the overhaul of his magneto and he will be on his way. This same service will be extended to his carburetor, his engine or any part of his Ercoupe airplane. We expect to carry this to the point where if a customer sends a damaged wing to one of our five bases we will be able to accurately estimate the cost of the repairs and ship him another wing, charging only for the repairs to his wing, thereby giving overnight service on any part or accessory of his Ercoupe airplane.

We believe that in this type of service lies the success of private flying, which needs modern airparks, the best of service at these airparks and first-

(Continued on page 49)

IN THIS SNACK ROOM, flying enthusiasts gather for a bite to eat, to do a bit of hangar flying, to fill out colorful postal cards provided without charge to any that want them.

Airport Distribution and What It Means

Many inadequacies are revealed by an analysis of the need of more airports based on regional distribution

By JOHN H. FREDERICK

THE Civil Aeronautics Authority released its National Airport Plan based on a survey of the need for a system of airports and landing areas throughout the United States. This plan proposes the construction of 3,050 new airports and improvement of 1,625 of the 2,942 civil and military airports already in existence, at a cost of $1,021,567,945 exclusive of land or airport buildings. With such a tremendous sum of money as this involved, there will naturally be those who will question whether the public necessity requires such an expenditure to further civil and commercial use of the airplane. Everyone interested in airports should be ready to answer the question if it is put to him. Here are some points to use:

1. By investing twenty-five billion dollars in highways during the past twenty-five years, we put the people of this country on wheels. For a much smaller investment we can start the United States on its way toward becoming a nation on wings.

2. At the close of the war there will be at least 6,000,000 people in this country who will know something of the techniques of aviation. No one knows how many of these will actually take up flying as a vocation or avocation but if only 25 per cent of them do so, we will have a pool of 1,500,000 actual airport users to say nothing of other millions of airline travelers. To satisfy these people, the utility of the airplane must be increased and one way to do this is to provide airports near their homes or places of business, near recreational areas and other places to which they may want to fly.

3. The sale of personal planes offers the only hope for a mass market for our peacetime aircraft manufacturing industry. At least a nucleus of this industry must be maintained as a substantial source of employment in peace, and for defense should we need to employ airplanes as weapons again. Personal planes will not be sold in any great number unless airports are provided in much greater number than today.

4. The benefits of scheduled air transportation should be made available to all parts of the country. Most airports will be used for both personal and commercial flying but certainly present air carrier stops will have to be improved in terms of the number and length of runways, clearness of approaches, taxiways, parking and servicing aprons, or other features if commercial air transportation is to mean what it should in the United States. For example, there are now applications pending before the Civil Aeronautics Board to render scheduled service to 678 communities, most of them not now receiving such service, but only ninety-three of these have suitable airports. Improvement projects would be required at 385 of these points (257 of them have no paved runways) and entirely new airports would have to be constructed at 200 of these towns all of which are deemed worthy of airline service.

5. Existing airports are so distributed that only 1,635 or 53 per cent of the 3,076 counties in the United States have one or more landing areas. Because of a deficiency of airports, airline services and private and other flying have been seriously restricted in the past.

Airports Affect Air Service

According to the 1940 census, the population of the United States totaled 131,669,275. The distribution of population of the United States by geographic division and the proportion of population with scheduled commercial service in 1940 is given in Table I. It will be seen that of the total number of people, 39,262,344 were living in the 211 towns and cities designated for air transport services by scheduled carriers. The Middle Atlantic region consisting of New York, New Jersey, and Pennsylvania shows the greatest concentration of population with 20.92 per cent of the total of the country. More people in this division (30.74 per cent) had direct access to commercial air services than in any other part of the United States. The East North Central division with approximately the same percentage of population as the Middle Atlantic ranks second in the number of persons having direct air transport services with 23.51 per cent of the total. The Pacific division, while it ranks seventh, with 7.39 per cent of total population, has the third largest population with direct airline service amounting to 10.01 per cent. It is probably coincidental that this region, with about one-third the population of the Middle Atlantic section, has approximately the same ratio with reference to the percentage of population with air service. In each of the remaining divisions the percentage of total population exceeds the corresponding figure for the number of people served, although the variation is not great in any instance.

The outstanding fact to be observed from Table I is the dispersion that exists between the percentages of divisional population now having direct access to scheduled air services. Here again the Middle Atlantic region is predominant with 43.04 per cent of population having such facilities. This high ratio is accounted for because the large population centers of New York City, Buffalo, Philadelphia and

TABLE I

DISTRIBUTION OF POPULATION BY GEOGRAPHIC DIVISIONS AND PROPORTION OF POPULATION WITH SCHEDULED AIR PASSENGER SERVICE IN 1940*

Geographic Division	Total population in U. S.	Per Cent of total population in U. S.	Population with scheduled air service	Per Cent of total population with scheduled air service	Per Cent of total divisional population with scheduled air service
New England	8,437,290	6.41	1,700,819	4.33	20.16
Middle Atlantic	27,539,407	20.92	12,072,556	30.74	43.04
East North Central	26,626,342	20.22	9,231,334	23.51	34.67
West North Central	13,516,990	10.27	3,194,473	8.14	23.63
South Atlantic	17,823,151	13.54	3,672,265	9.35	20.60
East South Central	10,778,225	8.18	1,656,444	4.22	15.37
West South Central	13,064,525	9.92	2,758,834	7.03	21.12
Mountain	4,150,003	3.15	1,044,769	2.66	25.18
Pacific	9,733,262	7.39	3,930,850	10.01	40.32
TOTALS	131,669,275	100.00	39,262,344	100.00	29.08

*Compiled from the **16th Census of the United States, 1940**, Bureau of the Census, 1941, and the **Airline Traffic Survey, September, 1940**, Civil Aeronautics Board, 1941.

Pittsburgh are in this region. Bearing out the identical population ratios referred to above, the Pacific division with 40.32 per cent shows approximately the same degree of development as the Middle Atlantic section. The large cities of Los Angeles and San Francisco give prominence to this region. The East North Central division with the large cities of Cleveland, Chicago, and Milwaukee and serving 34.67 per cent of the population ranks third in passenger traffic development.

Smaller Cities Need Service

It is of particular interest to note that the Mountain district stands higher than the remaining divisions, all of larger population and smaller land area, with service for 25.18 per cent of its people. While the better showing of the Middle Atlantic, East North Central and Pacific divisions is attributable to the predominance of large concentrations of population, such a characteristic is not present in the Mountain area. It thus appears that this region's high relative position is due to a smaller population and a larger number of points served as contrasted to a large concentration of population at a few points and a smaller number of points served as is the case in some of the other divisions. The remaining five divisions show a variation of only 8.26 per cent in the amount of population served, the highest per cent being 23.63 in the West North Central section and lowest 15.37 per cent in the East South Central division.

6. Smaller towns should be particularly interested in seeing the CAA or some similar national airport plan adopted since it is the communities under 25,000 in population that show the greatest lack of airport facilities. This is shown in Table II.

7. The chief criticism of airmail service today is that not enough of our cities have direct airline service. The distribution of scheduled trunkline air services to the cities of the different size-groups as shown in Table III illustrates the restrictive nature of the present policy of designating as air mail stops only those cities which are of sufficient economic importance to justify scheduled service and have airports suitable for such service. The most significant fact is that 106 of the 211 airline stops are at cities of 50,000 population and over. The remaining 50 per cent of the scheduled airline stops are somewhat evenly distributed among the cities of the smaller size groups. Practically all of the 105 cities of less than 50,000 population, and many of larger size, are, however, designated as air mail or scheduled airline stops because they are conveniently located at some intermediate point between the larger trunkline terminals or because they possess some special characteristic such as Muscle Shoals and Boulder City, where Federal power projects are located.

When the amount of air mail is compared with the total first class mail originating in the United States, it can be seen that the present use of the more rapid service is very limited. Of nearly six billion pounds of mail of all classes handled during a recent year, air mail comprised less than 1 per cent of the total, while the relationship of air mail to total first class mail, not including local delivery letters, was about 4.50 per cent.

All factors considered, it is unlikely under present airport and operating conditions, that the ratio of air mail to first class mail will show any substantial increase. The present postage rate differential offers little incentive for the use of air mail, and over short distances the higher air mail rate is actually a deterrent to the use of this service. With the vast proportion of our cities and towns not having airports suitable for direct airline service, the loss of time in transferring mail from one agency of transportation to another frequently makes the difference in the postage rate the deciding factor in the choice of the mail service used.

In order to obtain a high degree of utilization of air mail it is of paramount importance that airports be developed in all sections of the country. At the same time it would be a great incentive to this development if there were an adjustment of postal rates either by minimizing the differential in present rates or by carrying all first class mail by air at one rate.

If most of the cities having first and second class post offices, which together comprise about 12 per cent of all post offices, had airports and so could be served by feeder airlines at least, a considerable step would be taken in the direction of providing complete air mail service for the greater part of our population and industries of economic significance. ★

TABLE II

DISTRIBUTION OF EXISTING AIRPORTS BY URBAN PLACES*

Population Group	No. of Places	Population	Existing Airports	Population Per Airport	Airports Per City
Over 500,000	14	22,367,825	51	438,585	3.64
100,000-500,000	78	15,620,164	212	73,680	2.73
50,000-100,000	107	7,343,917	140	52,457	1.30
25,000- 50,000	213	7,417,093	199	37,272	0.93
5,000- 25,000	1,630	16,648,792	927	17,959	0.56

*From CAA "National Airport Plan", 1944.

TABLE III

CITIES AND TOWNS IN THE UNITED STATES BY SIZE-GROUP, AND THOSE DESIGNATED AS SCHEDULED AIRLINE STOPS IN 1940*

Size—Group	No. of cities and towns	No. designated as airline stops
50,000 and over	199	106
30,000 to 50,000	145	23
20,000 to 30,000	161	20
10,000 to 20,000	535	37
5,000 to 10,000	991	17
2,500 to 5,000	1,422	8
TOTALS	3,464	211

*Compiled from the 16th Census of the United States, 1940, and the Airline Traffic Survey, September, 1940.

MODEL AIRPARK

(Continued from page 47)

class, modern overhaul depots strategically located to render dealers and customers overnight service, no matter where they live. This type of service will be provided in the territory we serve.

Storage

Storage facilities for aircraft at the Curtiss-Parks Airpark include two large masonry and steel hangars; one 220 by 200 feet and one 100 by 120 feet sufficient to house eighty-five to 100 airplanes of varying size. Hangar rentals are reasonable and the cost is

Wing Span	Monthly Storage	Daily Storage
Up to 39 ft.	$14.75	$1.00
39 ft. and up to 45 ft.	18.75	1.50
45 ft. and up to 50 ft.	24.00	1.50
50 ft. and up to 55 ft.	28.00	2.00
55 ft. and up to 60 ft.	32.00	2.00

A telephone call or word left with the attendant, who greets the visitor upon arrival, will assure having the airplane on the line at departure time.

The Parks Aircraft Sales & Service organization, in addition to distributing the Ercoupe airplane, will represent leading aeronautical parts, accessory and supply manufacturers. A large, controlled inventory will be carried at each base to properly serve dealers, repair stations and private owners in the territory. We will have technically-trained flying representatives calling on the trade to assist our customers with their problems, and to work with them to see that they get the best possible service from the products that we distribute.

We are thoroughly convinced that in the past the aviation industry has not attracted the class of people that can afford to buy and maintain an aircraft, principally because of inadequate facilities, improper marketing and poor service. We do not believe that anyone will question the fact that poor service drives more customers away than any single factor. We propose to correct these evils. ★ ★ ★

Eclipse AUTOMATIC

BOOST CONTROL

ECLIPSE AUTOMATIC BOOST CONTROLS ARE DESIGNED FOR APPLICATION TO VARIOUS SINGLE STAGE—SINGLE SPEED, AND SINGLE STAGE—TWO SPEED SUPERCHARGED AVIATION ENGINES.

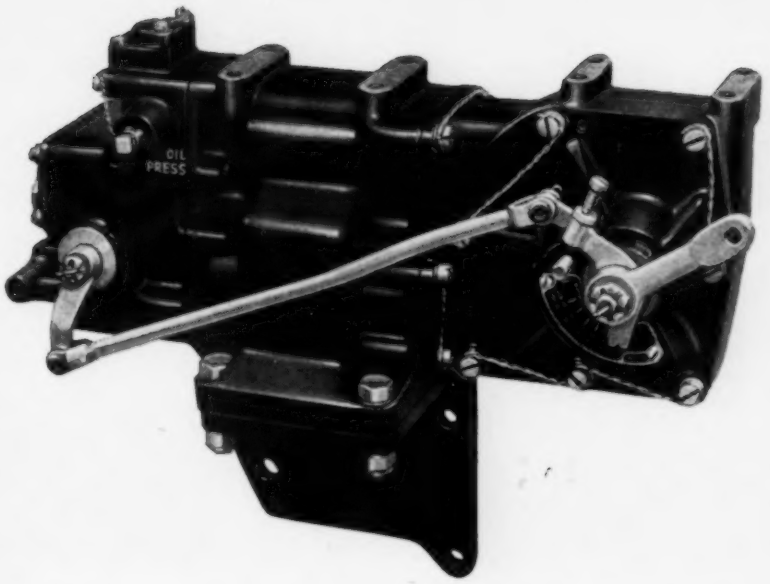
Due to military restrictions, design and engineering data on Eclipse Automatic Boost Controls are available only to manufacturers approved by the U. S. Government. To such companies interested in the solution of their engine control problems, Eclipse-Pioneer will be glad to supply complete information and engineering cooperation on request.

EVERY ACCESSORY ANY PLANE NEEDS—ENGINEERED AND BUILT WITH ECLIPSE CRAFTSMANSHIP

BENDIX, ECLIPSE AND PIONEER ARE TRADE-MARKS OF BENDIX AVIATION CORPORATION

BUY MORE WAR BONDS
SPEED V-DAY

Eclipse



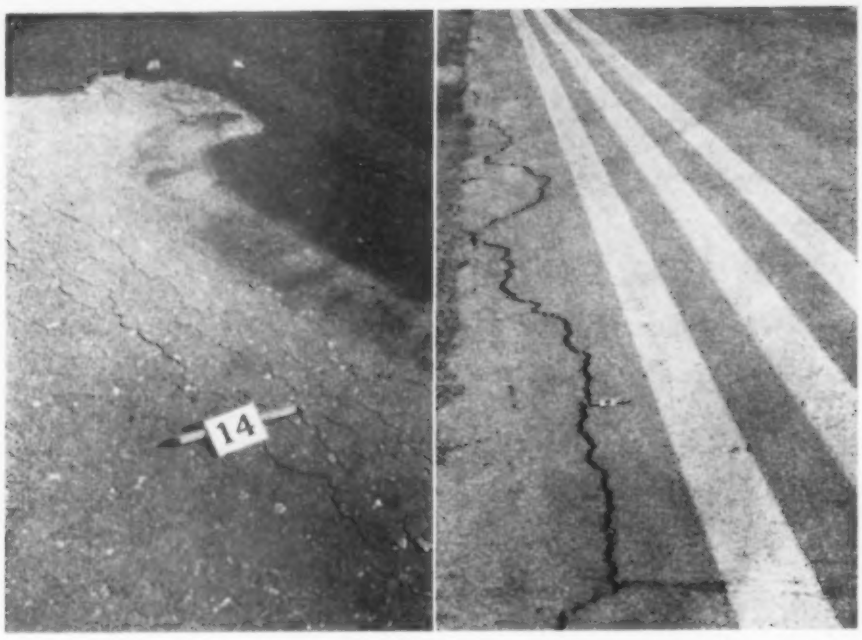
protects engine from detonation or overstress

automatic throttle adjustment reduces pilot fatigue

AVIATION ACCESSORIES

Bendix

Eclipse-Pioneer Division • Teterboro, N. J. • Los Angeles 36, Calif.



Here are two common pavement ills. At left is first stage of failure from standing water (dark background). The surface will have to be removed and the base dried out and resurfaced, with entire area leveled. At right is an edge crack caused by subgrade shrinkage, needing asphalt seal to prevent moisture from entering base.

—(CAA Photo.)

CAA OFFERS AID

The accompanying article is the third in a series prepared by the Airports Service of Region Four, Civil Aeronautics Administration, Fort Worth, Texas, which will welcome requests from airport owners, regardless of whether the airports are privately or publicly owned, for assistance in solving maintenance problems. CAA field men will visit airports and make specific recommendations in each instance, insofar as practicable. CAA also will provide public agencies which have received Federal aid with copies of specifications used in constructing their airports, and will be glad to have field men inspect defective pavement and make specific recommendations for repair or maintenance.

AIRPORT MAINTENANCE

PART III

AIRPORT PAVEMENTS

LAST month's article on airport maintenance reviewed maintenance of turf. This article deals with the maintenance of airport pavement. To derive the greatest benefit from the useful life of an airport pavement, adequate and timely maintenance is essential. Planned and routine maintenance may extend the life of a pavement by several years and is absolutely necessary to prevent hazardous as well as costly damage being done. Any public official recognizes the necessity of maintenance of pavement on streets and highways and will no doubt realize that it is also necessary to maintain pavement on an airport, as deterioration is due to the combined actions of traffic and weather, items which are common to all three types of utilities. While the traffic count on an airport runway may not be as great as that on a highway or street, the loads are greater and the action of the elements is the same in all cases.

Maintenance Organization

In considering the maintenance setup for an airport, it may be easier to visualize the requirements when it is understood that the average three-runway airport, together with its taxiways, is equivalent to twenty to twenty-five miles of ordinary highway paving with about 50 per cent more right of way. When this comparison is recognized, it is easy to see that the maintenance on airport pavement is no small item. Ordinarily a highway of this length will require a truck and crew of about four or five men, together with all necessary hand tools and such other items of equipment as asphalt kettle, small concrete mixer, light roller, tractor and mowing machine for general maintenance. Periodically such equipment as motor patrol, tractor and blade, power scraper, bulldozer, or even a small power shovel may be required. An airport would require approximately the same maintenance set up except that, since on an airport, shoulder or erosion maintenance is not so great, the size of the regular crew may be cut to two or three men with truck and hand tools. An asphalt kettle is required for maintenance on any type of pavement and one should be assigned to the airport. A small concrete mixer is also desirable and if not readily available from the city street or sewer department, one should be purchased for the airport. Mowing machines for exclusive use at the airport are essential. Ordinarily the need for heavier equipment such as motor patrol and power scrapers is periodical only and arrangements should be made for obtaining such equipment from the street department or county highway department when needed.

In addition to equipment, stockpiles of aggregates, asphalt, cement or other materials necessary for proper maintenance of the type of pavement on the airport, should be maintained. In the case of asphalt pavement on flexible base, the stockpiles should contain base course aggregate already mixed and ready for use. A small stockpile of premixed asphaltic material should also be available at all times for use in repairing damaged asphalt surface course or for settlements or for temporary repairs to broken concrete pavement.

General

Various pavements require certain maintenance procedures peculiar to particular type under consideration, but there are some items of maintenance that are common to all types. The most common one of these is shoulder maintenance. Shoulders along pavement should be kept low enough at all times to permit rapid and complete drainage away from the pavement. This is an item that will have to be attended to every two or three years. Sod along paving has a tendency to build up partly due to the natural accumulation of decayed vegetable matter and partly from dirt washing off pavement lodging in the grass. The grass adjacent to the pavement also usually has a tendency to produce a more abundant growth than elsewhere on the airport due to the additional moisture secured from runoff from the paved area. When the sod builds up to such an extent as to interfere with rapid drainage from the pavement, it should be cut off with a blade grader and removed from the area. If this work is done at the proper time of the year, it provides a good source of grass roots for use in barren or thin areas or may be deposited on slopes or in washes. If this type of maintenance is not taken care of, water accumulating along the edge will enter the base course or subgrade and may cause edge or even more extensive failures in the pavement.

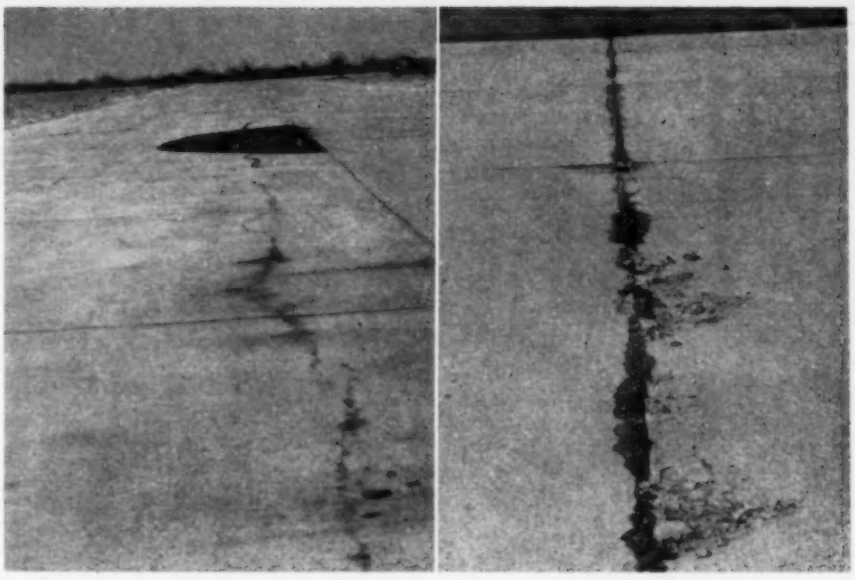
Concrete Pavement

One of the primary items of maintenance on concrete paving is the sealing of cracks and joints. It is essential for long useful life of pavement

and ultimate economy in maintenance that all cracks and joints be kept sealed at all times. The pavement should be gone over once a year and all new cracks sealed and all old ones checked and resealed if necessary. The best time to do this is in the fall of the year after the cracks have opened up and before the rainy season starts. Joints or cracks left open and unsealed will provide a lodging for sand or dirt and will permit water to reach and saturate the subgrade. Dirt lodging in these joints or cracks prevents the crack from closing again with subsequent expansion of the pavement, thus causing the pavement to "grow." This growing action has to be taken up in expansion joints with the resultant decrease in the efficiency of this joint. The expansion joint itself may be open permitting the entrance of water and dirt, thus further limiting its capacity to function properly. This growing action may be so extensive that "blow-up" will start in concrete pavement in as short a period as five years after construction. When a "blow-up" appears, there is no question about the maintenance as it has to be repaired and repaired at once, as it is a very definite and serious hazard which may cause both wrecked aircraft and loss of life. Cracks in a mile of pavement can be sealed for less than the cost of repairing one "blow-up."

Water entering the joint will saturate and weaken the subgrade. With an excess of water, some types of subgrade will lose all stability and permit the pavement to flex at the joint as a load crosses it. This flexing of the pavement will cause the joint to "pump," that is, the water and soil will squirt up through the joint. With continued pumping enough soil is lost from the subgrade so that the pavement is left unsupported. Pumping action is usually the greatest near a corner of a slab and repetition of loads will eventually cause the pavement to crack across the corner. This crack is usually from three to four feet from the corner of the slab. Sufficient settlement or breakage at a corner will require the removal and replacement of considerable area adjacent to the corner in order to effect proper repairs. On the other extreme, the subgrade may be a material that is subject to appreciable volume change in the presence of water. If such should be the case, the subgrade may swell and cause the pavement to raise or warp at the joint. Such a condition may cause the pavement to become excessively rough even to such an extent that resurfacing or leveling is necessary. Proper joint maintenance will materially delay, if not entirely prevent, the above named conditions.

Another detail of joint maintenance which should not be overlooked is the item of foreign matter such as gravel, rock or small metal objects lodged in expansion joints. Such items become embedded in the joint sealing compound and frequently cause spalling along the expansion joint. Spalls at a corner or longitudinal cracks starting a few inches from a corner may be due to concrete or rock in the end of the joint. If spalling starts showing up along expansion joints, the condition should be investigated and the cause determined. If numerous large particles of stone or gravel are found in the joints, all joints should be cleaned out entirely and repoured. While this may, at first, seem an excessive requirement, it will be found to be far cheaper than continual repairs to spalls which will continue to show up for a good many years. Spalls may be repaired with a cold asphaltic mix or large spalls may be trimmed to vertical edges with a chisel and repaired with concrete. Filling of spalls with hot poured asphalt is not satisfactory. Asphalt for sealing joints should be asphalt cement having a penetration of between forty and eighty. Prior to sealing, loose spalls and dirt should be cleaned from the joints. Blowing out the dirt with compressed air is very desirable.



ASPHALTIC MIXTURE REPAIRED cracks in concrete at left and depression shown in background. Photo at right shows severe spalling along concrete paving expansion joint. Because of rocks in seal, this joint will have to be cleaned out and resealed. —(CAA Photos.)

Asphalt Surface Course

There are several types of asphalt surface courses, namely, Hot Mix Asphalt, Cold Mix Asphalt, Natural Rock Asphalts, and Asphalt Surface Treatments, and the same general type of maintenance applies to all. All types are subject to cracking due to temperature change, drying and hardening of the surface, or movement of the base course and such cracking permits the entrance of water with subsequent damage to either one or both the surface course and base course. Upon completion, asphalt pavements, with the exception of some Rock Asphalts, are usually given a seal coat consisting of an application of a cutback or hot asphalt and covered with light colored sand or stone chips. The asphalt seals cracks or porous spots in the surface course and prevents the entrance of water while the cover aggregate presents a non-skid surface and prevents the seal coat asphalt from being picked up on the wheels. A light colored aggregate is essential on airports to improve visibility.

One of the primary maintenance items of asphalt pavements is proper maintenance of the seal coat. The pavement should be gone over at least once a year, preferably in the fall, and all cracks showing up should be sealed with hot asphalt. Wheels of landing aircraft loosen the seal coat aggregate by scuffing, and also the asphalt pavement has a tendency to dry, harden and crack with age. Due to these conditions, it is usually necessary to replace the seal coat about every three to five years in order to liven up the pavement and to seal it against the action of water and weather. During the early life of a seal coat, loosened aggregate can be made to stick again by respreading and rolling the loose material during hot weather. In some instances where the loosened material has been blown or washed away, it should be replaced with new aggregate from the stockpile. At times, due to an excess of asphalt having been used, the seal coat will "bleed" and such bleeding has to be blotted with an application of additional seal coat aggregate and rolled.

Failure in a surface course should be repaired by removing the existing material and replacing with new surface course mix, preferably of the same type as used in the original pavement. However, a good cold patch material may be used very successfully for repairing either hot mix or cold mix surfaces, or surface treat-

ments. Failure of surface course alone is usually evidenced by shoving or corrugating, raveling, or potholing, the first of which may be caused by an excess of asphalt in the surface course mixture, or water in the surface course mixture or between it and the base course. Raveling and potholing maye be due to insufficient asphalt in the mix. This condition, when aggravated by the action of water and traffic, causes the aggregate to loosen and be thrown out. This can be prevented by proper maintenance of the seal coat.

"Bird-baths" or depressions left in the pavement surface or settlements occurring in the surface are a flying hazard and a potential failure and may be corrected by building up the low areas with a new asphalt mixture. It is advisable to outline the area of such depressions with paint or chalk immediately after a rain. Prior to placing new material the existing surface should be thoroughly cleaned of all loose material and dirt by sweeping and given a tack coat of asphalt.

Flexible Base Course

Failure of an asphalt surface course may be due to failure of the base course or subgrade, caused by frequent repetition of loads in excess of the design load; by water entering and weakening either the base course or subgrade; inferior or unsuitable base course materials; or an unstable subgrade. Failure of weakening of base course or subgrade is first indicated in the surface by fine parallel cracks running in the direction of traffic and as failure progresses by cross cracks causing an appearance that is known as "alligator" cracking. Complete failure of such areas may be materially delayed by sealing the area with an asphalt seal coat to prevent the entrance of water. However, if it is a complete failure, as indicated by rutting of the surface, the only thing to do is remove both surface course and base course to determine whether failures are in base course or subgrade. If subgrade is found to be wet and soft, it should be removed and replaced with a suitable granular material thoroughly compacted in place, after which the base course material may be replaced and compacted and surface restored. If the base course material is found to be wet and sticky, indicating an excess of clay, it should not be reused, but should be corrected or replaced with a suitable base course mix which does not contain detrimental amounts of clay. If the base course material is non-plastic, but wet, it should be dried before reusing.

Drainage is an all import item to proper preservation of flexible bases and maintenance should always be toward the end of preventing excess water from entering either the base course or subgrade by providing rapid and complete drainage of surface water away from the pavement. If underground water is suspected to be causing the damage, its source should be located and underdrains installed to cut off the water before it enters the subgrade or base course.

This is the third article on Airport Maintenance. The first appeared in the January issue and dealt with the importance of early and systematic maintenance, especially on the landing areas and embankments and to the drainage system. The second appeared in the February issue and dealt with establishment and maintenance of turf on an airport. ★ ★ ★

HONORS FOR CONGRESSMAN Jennings Randolph (center) were bestowed last month by Secretary Pat Moore of the American Association of Airport Executives (left) with CAA Director of Airports Charles B. Donaldson looking on, for faithful service to aviation in general and airport executives in particular.
—(American Road Builders' Assn. Photo.)

COLD MIX PATCHING MATERIAL is shown here being applied by a maintenance crew to repair a surface course consisting of six-inch soil-cement base with blended asphalt surface.
—(CAA Photo.)

Airport Construction

Construction awards by the Chief of Army Engineers announced last month included:

ALBUQUERQUE, N. M. — K. L. House Construction Company, Albuquerque, for construction of hangar at Kirtland Field at an estimated cost of $144,050.90.

ALBUQUERQUE, N. M. — Robert E. McKee, El Paso, for construction of hangars at Kirtland Field at an estimated cost of $279,150.00.

SHREVEPORT, LA.—E. O. Korsmo Construction Company, Memphis, for construction of hangar at Barksdale Field at an estimated cost of $128,861.00.

ROSWELL, N. M. — Homer A. Parks, Dallas, for construction of hangar and relocation of buildings at Roswell Army Airfield at an estimated cost of $146,784.00.

TUCSON, ARIZ.—Basich Brothers Construction Company, Alhambra, Calif., for construction of taxiways, warm-up and parking aprons at the Davis-Monthan Field at a cost of $942,816.00.

GEORGETOWN, TEX. — Brazos Valley Construction Company, Mineral Wells, Texas, for construction of the Georgetown Municipal Airport at a cost of $630,550.37.

EL PASO, TEX.—C. H. Leavell, El Paso, for construction of hangar and relocation of buildings at Biggs Field. The cost is estimated to be $139,813.

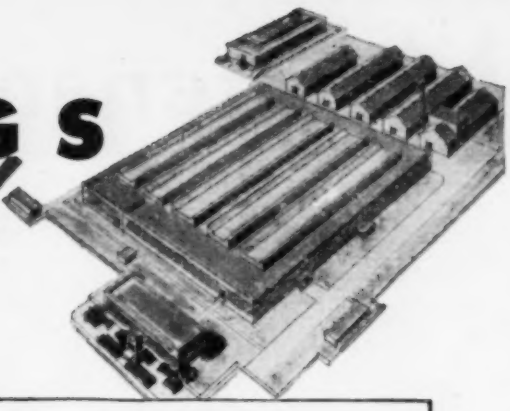
MONTGOMERY, ALA. — Bear Lumber Company, Montgomery, for construction of hangar at Maxwell Field. The cost is $130,092.80.

GULFPORT FIELD, MISS.—R. P. Farnsworth & Company, New Orleans, for construction of hangars, including utilities at Gulfport Field at a cost of $344,666.92.

SAVANNAH, GA.—Edwin Braun, Savannah, for construction of additional buildings at Chatham Army Airfield. The cost is approximately $84,648.00.

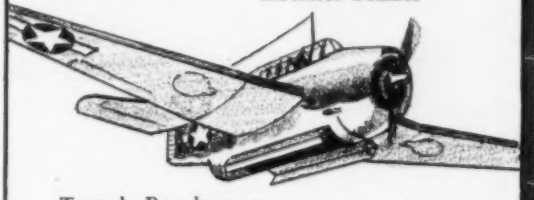
SEATTLE, WASH.—A. W. Johnson, Co., Inc., Seattle, for construction of service buildings at Boeing Field. The cost is approximately $46,573.75.

FIRST THINGS *first!*

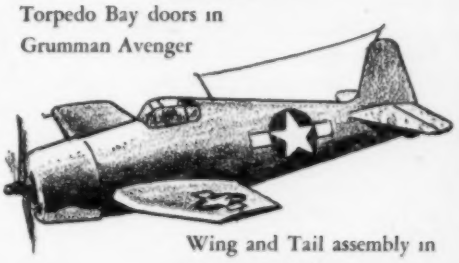


FOR COMBAT AIRCRAFT:

Tail gun turret in B-24 Liberator Bomber



Torpedo Bay doors in Grumman Avenger



Wing and Tail assembly in Grumman Hellcat

POST-WAR PRODUCTION PLANS

SOUTHERN AIRCRAFT CORPORATION has been detailed to manufacture aircraft components for the front line fighting planes. They have been asked to redouble efforts in production of the items so badly needed by the men who are fighting at this crucial hour. Nothing else can share in their attention to the things first on the list.

With Southern Aircraft, *first* things have *always* come first. Now, every skill . . . every action, of Southern's highly trained crew strives toward final Victory. Yet, quietly waiting in the background of wartime activity in Southern's experimental laboratory, are readied plans for a peacetime world. Then, as now, first things shall come first with Southern Aircraft.

Remember, look for the name Southern. For in the days of peace ahead, first things in aviation will come from...

Southern

AIRCRAFT ★ CORPORATION

PLANT IN GARLAND, DALLAS COUNTY, TEXAS

Maintenance of Airport Lights

PART II.

Valuable and practical steps to follow in servicing airport lighting systems are contained in this conclusion to an article published last month.

By J. S. HANEY
Airport Lighting Engineer
Crouse-Hinds Company

Due to the design and method of installation, flush-type fixtures probably require more attention than any other standard type of lighting equipment. This is particularly true during periods of adverse weather. Regular inspection and care every two to four weeks, including the following, will do much to prevent failures.

1. Clean lens of sand, mud and snow.
2. Where required, replace broken lens or reflector. Before replacing lens, inspect lens gaskets and clean gasket surfaces. Replace gaskets where necessary. If replacement lens or other parts are not immediately available, it may be advisable to replace top assembly with temporary wood cover.
3. Clean interior; remove any moisture and wipe out completely.
4. Check socket contacts and clean if necessary.
5. Replace burned-out lamps and film cutouts. Removal of lamps may be facilitated by wrapping a cloth around the lamp and pulling the cloth up.
6. Cut grass and weeds near fixture with particular attention to clearance of light beams up and down runway.
7. Paint concrete bases, where necessary.

Temporary wood covers, drilled to fit contact light bases, can be readily made of waterproof plywood. These can be kept on hand to provide temporary protection to interiors of marker light bases where top assemblies are defective.

Alignment of Contact Lights

Standard contact lights are designed to provide two main beams of light up and down the runway, as indicated in Figure 8. Flush range lights must be aligned exactly the same as the contact lights in respect to the runway. The marking arrows on the fixtures should be perpendicular to the runway center line. In this regard, notations on some fixtures, such as "THIS SIDE NEXT TO RUNWAY," are incorrect for range light use, and should be applied as "THIS SIDE TOWARD RUNWAY CENTERLINE."

It is important that lamp, reflector, and lens be positioned correctly, since these light beams are quite narrow and must be aimed accurately to give the necessary indication to pilots approaching at a normal glide angle. The light beams are "toed in" approximately three degrees, and should project about four degrees above the horizontal. Alignment of the beams can be checked by holding a sheet of paper sixty inches from the light in the main beam. The amount of "toe-in" at a distance of sixty inches should be about three and one-eighth inches, and the "rise" above the vertical at a distance of sixty inches should be about three and three-eighths inches. These distances of three and one-eighth inches and three and three-eighths inches are measured to the center of the main beam on the paper perpendicular to the beam.

Most existing flush fixtures are equipped with heat-tempered, impact-resisting, glass lens. The composition of this glass is such that it may completely shatter when only a slight portion of the outer surface is broken. This glass, however, is considerably stronger than standard glass as previously used. When broken, pieces of heat-treated glass will not have the sharp edges found on standard glass, which may cut airplane tires.

Keeping Fixtures Watertight

With flush fixtures, the problem of water entrance is ever present. Surface water may enter, or moisture due to condensation. Either surface water or air-containing moisture may be drawn into the fixture by "breathing" action in the fixture caused by pressure changes when heating and cooling. None of the following should be overlooked in checking leakage.

1. Broken or cracked lens.
2. Main top assembly joint.
3. Lens and cover gasket joints.
4. Relamping cover screws.
5. Cable entrance in base.
6. Cable jackets in base.
7. Conduit threads in base.
8. Cracks in base casting.

In order to seal the main top assembly joint properly, gasket surfaces must be entirely free from galvanizing lumps, dirt and sealing compound. Care must be taken to tighten main bolts gradually and evenly in order to

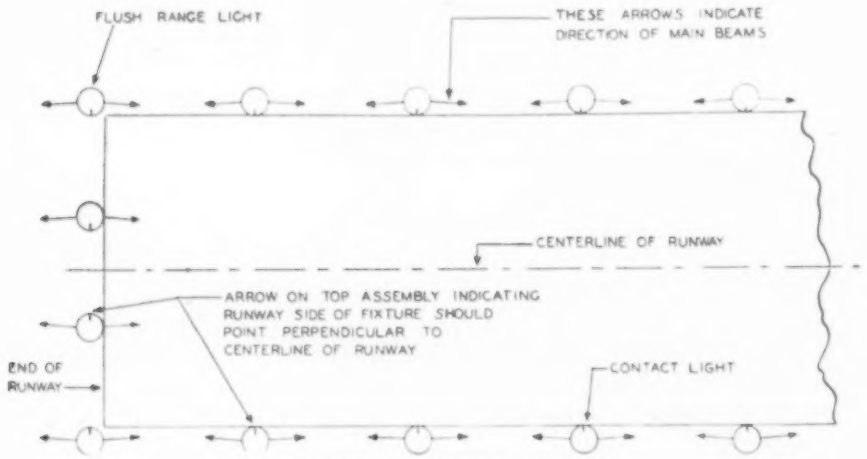

FLUSH RANGE LIGHT
THESE ARROWS INDICATE DIRECTION OF MAIN BEAMS
CENTERLINE OF RUNWAY
ARROW ON TOP ASSEMBLY INDICATING RUNWAY SIDE OF FIXTURE SHOULD POINT PERPENDICULAR TO CENTERLINE OF RUNWAY
END OF RUNWAY
CONTACT LIGHT

Fig. 8. Alignment of flush runway lights.

LEADERS TODAY . . . in Petroleum Production for Wartime Aviation
PIONEERS TOMORROW . . . in New Products to serve the Age of Flight

FUEL FOR 400,000 BOMBERS

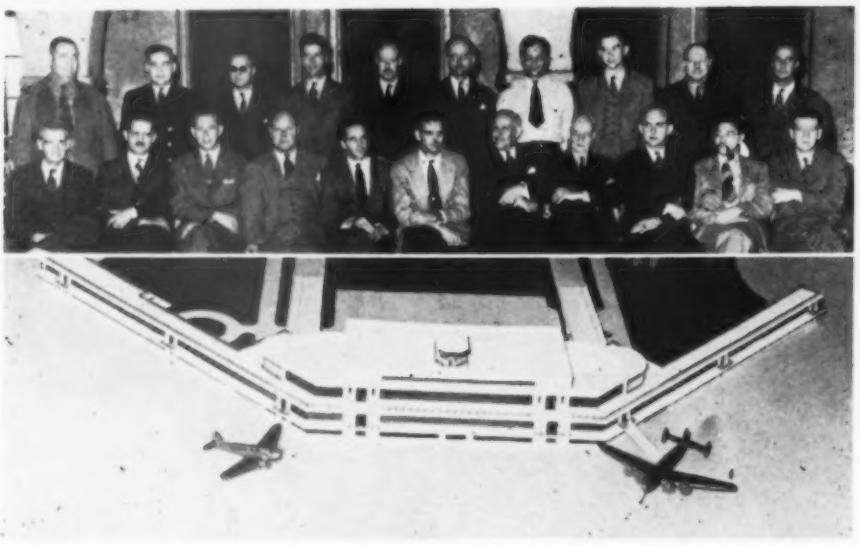
Last December 14th Humble's Baytown Refinery became the first plant in the world to complete a billion gallons of finished 100-octane aviation gasoline — enough to fuel 400,000 Flying Fortresses for a round trip from Britain to Germany. This remarkable feat, unparalleled in petroleum history, was possible through Humble's exceptional combination of resources, research and resolve.

TODAY—this production is helping our warplanes make history in every quarter of the globe. TOMORROW—these war-tested Humble-Esso Aviation products will make a new kind of history in the peace-time planes of commerce and pleasure.

ESSO

Humble-Esso Aviation Products

HUMBLE OIL & REFINING COMPANY



SAN ANTONIO'S NEW TERMINAL PLANS were reviewed by CAA, airlines and local officials recently. Shown above is a model of the proposed new structure. Ayres & Ayres, architects, prepared the model. In the group photo, left to right, are: Seated—M. L. Diver; Ed Baugh; C. L. Topol; Robert Ayres; Marc Thompson, CAA, Washington; S. E. Travis, Jr., CAA airports supervisor, Fort Worth; Mayor Gus B. Mauermann; Atlee B. Ayres; R. F. McKee, Continental Air Lines; R. M. Lewis, Braniff Airways; and E. H. Sittner, American Airlines. Standing—Lewis M. Yates; R. F. Hallman; Howell Jones; Jake Tiner; Frank Drought; C. L. Willis, Jr., CAA, Fort Worth; Andrew K. Novak; Boyd Carpenter; William Steinhardt, San Antonio airport director; and Wayne Parks, operations manager.

seal gasket correctly. Some fixtures are designed with a groove between the top assembly and the base, which, if left open, serves as a water pocket. In filling and sealing this joint, standard plastic roofing cement is easy to apply and has been found to be satisfactory for use over quite wide temperature ranges.

When lenses are disturbed or replaced, lens gaskets should be inspected and replaced if necessary. In most fixtures, gasket cement is recommended for sealing gasket joints.

Leakage sometimes occurs beneath heads of relamping cover screws. Washers should be inspected and replaced if necessary. On many fixtures, anti-seize compound applied to the screw threads and particularly beneath the screw heads will greatly aid in maintaining a watertight seal.

Much difficulty has been experienced in maintaining a watertight seal in fixture bases against the entrance of water "backing up" inside the housing. Compound is used in the base to seal the cable entrances and ends of the cable jacket. The difficulty in most cases is due to the compound contracting and pulling away from the walls of the casting. Wide variations in temperature may cause this. Some compounds are unsatisfactory in freezing temperatures.

It is important that the sealing compound be poured into the bottom of the housing at the correct recommended temperature. The temperature of the metal housing is also important, since if too cold, the housing will chill the compound too rapidly, preventing proper sealing. In some instances, the application of an asphalt paint or a mild acid such as a vinegar solution (acetic acid) have been used inside the housing to improve the adhesion of the compound to the housing walls.

Compound manufacturers should be consulted for recommendations under any particular conditions of voltage, temperature and type of fixture.

The best method of preventing water entrance through cable conduits is by use of cable squeeze connectors at outer ends of conduit nipples. Squeeze bushings must be of proper size and shape to fit cable. Plumbers pipe-joint compound, such as graphite compound not soluble in water, should be used on conduit threads.

Snow Problems

Large numbers of flush marker lights, even when protected by cast iron or concrete snow plow guards, are broken by snow plow blades and truck wheels with chains. Even the latest ANC model fixtures, although designed for a load of 100,000 pounds applied on the top assembly, necessarily have exposed glassware, and can be easily fractured by the impact of a plow blade. Rotary broom snow removers are the only type which can satisfactorily clean snow from directly around lights, and even with these it is usually necessary to complete the cleaning manually with shovels and brooms. Blade plows should be run around lights and followed by broom sweepers and manual cleaning. Small flag markers should be installed, attached to lights or stuck in ground near fixtures. Pipe sockets to hold flags can be provided in concrete pads. Flags can be attached by blackout hood screws on relamping covers.

Due to the low angle of the contact light beams, it is necessary to remove the snow a considerable distance on each side of the fixtures up and down the runway.

In operating lights in heavy snow areas, the following points should be emphasized:

1. Snow extension marker lights which plug into flush fixtures are available. Different models include cable-extension type and rigid fiber conduit-extension type. Isolating transformer should be provided in each flush unit.
2. It may be advisable to replace flush range lights with cone-mounted range lights.
3. Where flush lights will not be used, replace top assemblies with blank plywood or metal covers before cold weather.
4. During blinding snowstorms, it may be helpful to turn on landing field floodlights at both ends of runway.

Due to the high voltage hazard, snow extension fixtures should be always connected through isolating transformers in fixture bases. One type of fixture utilizes a special relamping cover with squeeze connector, special plug-in type transformer, twenty-five feet of portable cable, and vapor-tight globe fixture mounted on pipe standard and circular base for placing on top of snow. Another type includes a blank metal cover with a socket holder for a fiber conduit standard supporting a globe fixture and marker cone.

Underground Cable

Cable failures may be due to mechanical injury or deterioration of jacket and insulation. Grounding on a series circuit may cause dimming of some of the lights, which will assist in finding the fault. An open circuit fault may be difficult to locate and it may be necessary to test the entire circuit in sections to find where the circuit is open. Cables frequently fail at splice points and the location of all underground splice boxes should be marked.

To facilitate the checking of cable faults, it is advisable to keep a plan of the field marked with the location of all cable runs and splices. ★ ★ ★

WANTED: Man to Run Small Airport!

No experience necessary! You can make money, be your own boss, and run your own business—*your own airport!* This is the money-making end of aviation, the new postwar industry. Right now you may be a mechanic or a salesman, a small business man or an ex-service man. You don't need a big cash outlay or a fancy set-up. All you need is "know how"—and that's where Aeronca comes in.

Right where you live! Aeronca's been a leader in the personal plane field for more than 16 years, knows how it's done. This company has a complete, profit-making program that tells how to go about making money with a small airport in your own home town. The plan covers more than just selling planes, goes into every last detail—even the money you can make selling gasoline and oil—and that's only a minor part of the business.

The road to success is now in the air. This is one frontier that hasn't been closed. Any man of reasonable intelligence and ambition can build himself a profitable business. It's interesting and it's steady! You can start small and grow big—just like so many other business men. There's no reason why you can't put yourself into this picture. Aeronca shows the way. Just send for the booklets. Use coupon.

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Revenue vs. Costs AT SAN FRANCISCO

FIGURES furnished by Manager B. M. Doolin of San Francisco's Airport present an interesting study in the revenue-vs.-cost discussion initiated in these columns last year, indicating (a) a $45,276 loss for the current fiscal year and (b) several explanations for such a loss. Estimated revenues total $111,476 while estimated expenditures total $156,752.

"Since military operations constitute over fifty per cent of our activities here, and funds are not presently available for the expansion of terminal building facilities, we have been unable to provide room for many revenue-producing activities for which we have received applications," Doolin says. "If it were possible to expand our terminal building, particularly our restaurant and other public service facilities, we would be able to show a much higher anticipated revenue than is indicated in our budget.

"Under wartime conditions prevailing, civilian flying at the San Francisco Airport continues curtailed, and the landing field and many airport structures are leased to the War Department for Air Transport Command operations at $1 per year.

"As a result, it is estimated we will show a net loss of $45,276 for the fiscal year ending June 30, 1945, without taking into account expenditures for bond interest, bond redemption or reconstruction and replacements."

In other words, it appears the city of San Francisco is doing its part in assisting the military services win the war by standing a considerable loss. San Francisco Airport is not the only major U. S. airport allowing the Army use of its facilities on a dollar-per-year lease. That amounts to a serious load for any city to carry, particularly if that city, as in the case of San Francisco, does not have funds available to expand its terminal facilities to take advantage of new and additional merchandising ideas.

But there is one gain San Francisco will have, despite its current losses. A $5,000,000 seaplane base constructed by the Navy and acquired through the Treasury Island settlement, is now being used by Pan American Airways but will revert to city ownership within two years after the war, becoming an important addition to the airport.

Most of the airport's revenue comes from domestic air carriers, totalling $33,000 annually in landing charges alone. Second major source of revenue is in rental of facilities, for which $17,826 is being received. No revenue from sale of aviation fuel is shown. Domestic carriers using the field are United Air Lines, Transcontinental and Western Air, Inc., and Western Air Lines. Based on actual domestic air carrier figures for the last six months, it is estimated the airport will accommodate over 400,000 passengers, 25,000,000 pounds of airmail and 1,500,000 pounds of air express during the current fiscal year. These

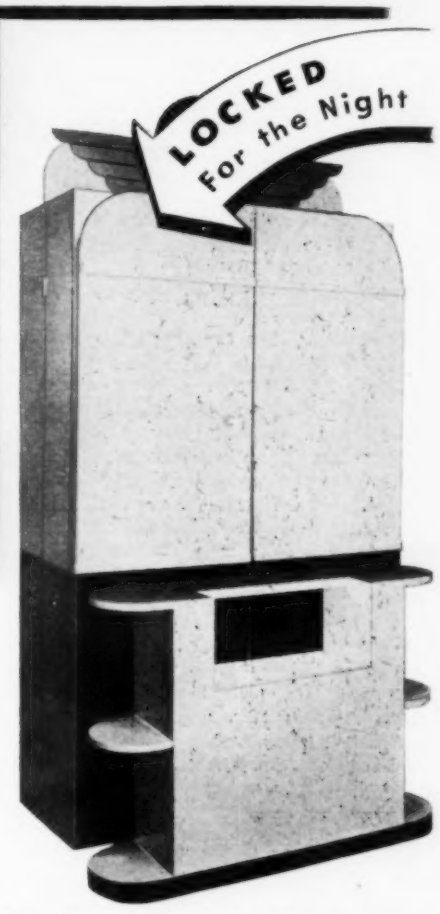
(Continued on page 64)

ESTIMATED REVENUES
Fiscal Year—1944-1945

Airlines:		
Transcontinental & Western Air, Inc.		
Landing Charges	$ 6,300	
Hangar	2,404	
Shop	1,026	
Office	1,350	
Electric energy	1,800	$ 12,880
United Air Lines, Inc.		
Landing Charges	$21,500	
Base facilities, hangar and operations	6,500	
Office	2,650	
Electric energy	27,500	$ 58,150
Western Air Lines		
Landing Charges	$ 5,200	
Shop	260	
Office	900	
Electric energy	200	$ 6,560
Concessions:		
Skyway Cafe		
Including Cafe, Cocktail Lounge and Magazine Counter	$13,000	
Electric energy	1,400	
Telegraph Agency (Operated by Airport).		
Commission	5,000	
Office	300	
Telephone:		
Commission	1,600	$ 21,300
Government:		
Civil Aeronautics Authority:		
Offices	$ 34	
Electric energy	2,500	
Weather Bureau:		
Offices	$ 1	
Electric energy	450	
War Department:		
Airport Lease	$ 1	
Electric energy	2,300	
U. S. Coast Guard Air Station:		
Electric energy	$ 4,850	$ 10,136
Miscellaneous:		
Land—Dairy	$ 2,400	
Miscellaneous	50	$ 2,450
TOTAL REVENUE		$111,476

AIRPORT CHARGES

Landing Fees (25,500 lb. gross):
First three schedules per month, each $150.00
Additional schedules per month, each 50.00
Landing Fees (over 25,500 lb. gross):
Per 1,000 lbs., per schedule, per month additional 1.00
Landing Fees (extra sections):
Over five per schedule per month, each 2.50
Over 25,500 lb. gross, additional ..... .10
Administration and Passenger Terminal Building (Temporary):
Rental of First Floor Space ..... $1.50 per sq. ft. per yr.
Rental of Second Floor Space ..... $1.00 per sq. ft. per yr.
Air Carrier Base Facilities:
Lease agreement—by bid. Individual Contract Basis.
Concessions:
Restaurant, Cocktail Lounge, Magazine, Pay Telephone—Telegraph Agency—Based on percentage of gross income.
Resale of Electricity:
At rates established by State of California Railroad Commission.



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2. *An opening inventory of accessory items most often called for at your airport, designed to fit your pocketbook, to give you rapid turnover, excellent profit.*

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YOUR "Warehouse Annex" FOR AERONAUTICAL SUPPLIES

★ AIRPORT MERCHANDISING ★

By DUDLEY M. STEELE
Manager, Lockheed Air Terminal

THERE are three main sources of revenue on this terminal. In the order of their importance, they are:

1. Sale of aviation gasoline and oil.
2. Food and Service Department (coffee shop, sky room restaurant, two cocktail lounges, and newsstand).
3. Garages, service station and parking lots.

Last month we discussed the method of handling aviation gasoline and oil. This month we will take up the subject of the "Food and Service Department".

At the outset let me state that, while we relate what we do on this terminal, we are not presuming to imply that the same things can or should be done by every other major air terminal. We can and do say that the methods employed by this terminal have proved highly successful from a management and financial standpoint. We know, too, that there are some things that a private airport can do but which, because of ordinances, charter provisions, etc., may not be possible for a municipal airport to do without revising ordinances and charter provisions. In any event, here's the setup at this terminal.

Coffee Shop: Some years ago we had the typical airport coffee shop with indifferent service, mediocre to poor quality of food, and very few selections on the menu, and it was situated where the customers could not see the airport. (Later the coffee shop was moved to its present location where the customers can see the airport.) Adjoining it was a small dining room with perhaps a dozen tables. Airline business picked up but the restaurant business at night did not justify employing **one** full-time waitress in the dining room itself. The coffee shop did a fair business. We tried to find some item with which we could attract people to the terminal, and finally hit upon something that was quite common—fried chicken. In addition, we hit upon a rather unusual spot announcement over the air on one of our smaller radio stations. This announcement went something like this:

"Don't go to Union Air Terminal for fried chicken . . .

(with a six second pause by the announcer before the balance of the announcement was read)

. . . Unless you are willing to wait thirty minutes while it is prepared to your special order."

"Union Air Terminal" was our name at the time this announcement was first put on the air prior to Lockheed's purchase of it in 1940.

Successful Experiment

Business picked up and soon our dining room was crowded. Then came the idea of a restaurant on the second floor overlooking the field. At that time our second floor was an open concrete deck from which the public used to watch the arrivals and departures of planes. We simply took this deck, roofed over one-third of it, and made a room large enough to seat approximately ninety-four persons, calling it the "Sky Room". It took a little courage to do this and to spend the $25,000 that it cost. But we believed the public would patronize the terminal. Within thirty days after the Sky Room was open our daily business in the coffee shop and dining room had increased over $1,000 per day and the place was packed, both during the lunch and dinner hours, and on many nights and Sundays there was a waiting line. In addition to the small Sky Room restaurant just referred to, we put in a cocktail lounge, which also was heavily patronized.

The management of this terminal probably knew as little about running a restaurant as the average pig does about Sunday. Knowing our own shortcomings, however, we took great care to see that the man we selected as manager had ample experience behind him. We paid this man a good salary. He has been with us ever since. It is our belief that the most profit from such an enterprise can be derived by operating it yourself instead of turning it over to an outside concessionnaire. We know this because we had the other type of operation at one time. We know what our profits were under that type and we know how much greater they are under our own exclusive management. One bad feature of turning the facilities over to an outside concessionnaire is the airport's inability to maintain the proper kind of service and to assure the public of the best food obtainable. Both of these things are certain if you operate it yourself. It **can** be done because we **have** done it.

Expansions: As our business grew, we placed circular tables, umbrellas, and chairs on each end of the open deck outside of the Sky Room and served lunches and dinners there, thus increasing our gross revenue by several hundred dollars daily. Lockheed Aircraft Corporation purchased the terminal in December, 1940. On December 15, 1941, we completed alterations and opened the present Sky Room, which seats approximately 275 people. This time we did the job right. We air-conditioned and soundproofed this room, doing away with the noise and giving proper eating comfort, both summer and winter. Our business immediately increased and we now serve some 4,500 persons daily in the coffee shop and the Sky Room. With a seating capacity in the Sky Room of 275, we have a waiting line now nearly every night in the week, and on Sundays people will stand in line for one to one and one-half hours. Our average Sunday business is approximately 1,400 dinners served between 1:00 p. m. and 10:00 p. m. In addition to our upstairs cocktail lounge, from which the public may view the activities on the airport, we have a lower cocktail bar immediately off the lobby. This cocktail bar does an excellent business as does the upper one. We operate both lounges.

Newsstand: Our newsstand sells the usual complement of magazines, cigars, cigarettes (when we can get them) boxed candy, candy bars, newspapers and the usual run-of-the-mill articles found in modern newsstands. Our business is good and the profits are excellent.

Quality Counts

Now let's digress a moment and talk about some things that are relative to the coffee shop, Sky Room, and cocktail lounges. Our coffee shop is spotlessly clean. Counters, silverware glassware, and metal work are kept meticulously clean and bright. Our waitresses are dressed in trim, clean uniforms and are trained to be courteous, to have a smile for the customer, and to give prompt service. The counters in the coffee shop are the typical, fast service, horse-shoe type. We have fifty-eight stools and we serve between 2,600 to 2,700 people daily. A little mental arithmetic will show you that this means between forty to forty-four people are served at every stool within the period the coffee shop is open—6:00 a. m. to 2:00 a. m. We buy only the best food obtainable. There is a wide variety of articles and the prices are nominal. In this connection, it should be noted that the prices in the coffee shop range approximately 10 per cent less than those in the Sky Room.

In the Sky Room the same meticulous methods of cleanliness, good service, courteous treatment with excellent food, tastefully prepared and served, are observed. Waitresses are in fresh, clean uniforms at all times. They are not permitted to allow their hair to become stringy. It must be properly coiffured. They are not permitted to wear dirty shoes with run-down heels nor are they permitted to go bare-legged. In normal times, linen table cloths and napkins were always provided. They will be again when conditions permit. Our kitchens likewise are kept clean. The arrange-

ON THE BEAM

-with pH control!

pH has proved to be the key to a new, high standard of efficiency in chemical cleaning and processing.

Kelite Service Engineers use pH constantly to control their cleaning and processing operations . . . to keep them steadily "on the beam" where they'll perform their functions with minimum time and trouble.

Kelite Chemists, building on the knowledge gained from thousands of pH tests in the field, have been able to develop materials precisely fitted to the cleaning and processing needs of the aviation industry.

Hot Tank Cleaning—Kelite KDL No. 1 cleans thoroughly without endangering the surface of the metal in any way. It is free rinsing. The preparation of aluminum for anodizing, chromodizing or spot welding is most efficient and reliable when KDL No. 1 is used in the cleaning bath. Time charts and inspection records prove this.

Spot Welding—Process K-1 (Kelite material for preparing aluminum for spot welding) was recently improved by the addition of a "B" factor which greatly increases the number of welds possible between tip cleanings.

Kelite Process K-1-B renders an aluminum surface extremely low in micro-ohms resistance. No heating is required for its use and no critical time element is involved. Complete assemblies may be processed. Exhaustive tests on parts with lap joints and faying edges show no evidence of corrosion by Process K-1-B over a long period of time.

De-greasing, De-carbonizing—Kelite Ketrex removes oils, grease, residual gums and light carbon by simple cold immersion. It is safe on all metals. Kelite Super Ketrex removes sludge and carbon.

Kelite AAF* is a rapid-penetrating solution which removes oils, grease, sludge, carbon and paint in a cold tank and is safe on all metals.

Kelite Protexol, the de-greasing spray, is a versatile helper in maintenance cleaning. It wets out grease, is safe on metal and painted surfaces.

Pre-Cleaning—Kelite Ketrex penetrates into the recesses of metal, forcing out particles of soil as well as oil and grease, and puts the surface in a condition which enables the rinse that follows to remove all excess contamination.

De-Scaling—Kelite Process K removes scale and corrosion, creates the proper tooth for reliable plating or paint adhesion and inhibits the action of rust—in one soak.

Spray Booth Control—Kelite Spray Booth Coating stops accumulation of paint on booth surfaces. Kelite No. 118-C-4 controls the paint which is captured in the water curtain.

Paint Stripping—Kelite manufactures a number of specialized paint strippers, including: Kelite G-Stripper, heavy duty hot tank material for ferrous metals; Kelite KDL No. 1, the outstanding hot tank cleaner for aluminum; Kelite Regal Remover, fastest-working cold stripper; and Kelite A.C. Stripper, a rapid paint stripper with the advantage of a relatively high flash point.

Removing Exhaust Stains—Good example of Kelite's attention to the special problems of aviation maintenance men is Kelite KDL No. 28, a sudsy-solvent liquid developed for the removal of exhaust stains. It performs this troublesome task with remarkable ease and thoroughness and is completely safe on aluminum.

Wherever there's dirt, grease, grime, scale, corrosion or any undesirable deposit or contamination, Kelite materials with pH Control can solve the cleaning problem.

Get the full pH story from your local Kelite Service Engineer. Learn how Kelite pH Control can put your cleaning and processing operations "on the beam."

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KELITE

SCIENTIFIC CLEANING THROUGH pH CONTROL

KELITE pH Control

ments for serving food have been so designed that the maximum number of orders can be secured from the cooks in a minimum amount of time.

Your airport can be made the center of interest in your city. As a matter of fact, there is no more interesting place in your city than its busy airport. We do not depend upon airline, terminal or aircraft employes for our patrons. Naturally, there are several hundred such employes who daily patronize both the coffee shop and the Sky Room. At night, however, and on Sundays, the public comprises 98 per cent of the crowds. If the environment is good, and the average airport's environment can be so made with a little care and planning, the public likes to view the airplanes and the activities from a vantage point. They also like to eat while viewing these sights. No amount of environment, however, or interesting sights can induce the public to return unless they have been given good food, properly prepared and courteously served, at prices that are within reason.

It has been said before, and is reiterated, that the large major air terminals cannot obtain sufficient revenue to meet their operating expenses from the airlines alone. The greater proportion of their revenue **must** come from other sources. We do not know of any better source than the food and service department mentioned in this article. It will pay you to investigate the possibilities of providing the finest possible food and service at your airport, if you are not already doing so, and of doing it **yourself**, retaining all the profits rather than allowing a concessionnaire to take over these services, paying you but a small fraction of what you would derive if you handled it yourself.

That's all for now. See you next month. ★ ★ ★

Special Tax Formula Proposed for Airlines in Minnesota Plans

Legislative committees of National Aeronautic Association and National Aviation Trades Association state organizations in Minnesota have been reported as planning to introduce four bills in the Minnesota legislature to revise aviation taxes and provide for additional airport planning.

The proposed revenue measure would institute a $10 minimum airplane registration fee based on 1½ per cent of list price, to replace the existing personal property tax on airplanes and to exempt airline planes, which would be assessed under a special formula eliminating multiple taxation of carrier equipment. Minnesota's 4-cent gas tax on aviation fuel would be continued. Other proposed measures would revise the state's aeronautics code to conform with the NASAO's uniform act and the revised zoning act recommended by CAA and NIMLO; enable state matching of U. S. and local airport financing and appropriate administrative costs, with gas tax and registration fees earmarked for airport funds; and establish a long-range state airport planning program.

Civilian Schools Seen Employing 10,000 Persons

Sixty-four present and former operators of Air Forces contract schools will be able to provide nearly 40 per cent of the 27,500 postwar jobs in the aviation industry, according to the Aeronautical Training Society. Thirteen contract schools are still engaged in training Allied fliers, while the other fifty-one are on a stand-by basis. Expansion of civilian services are expected to bring the employment by contract schools past 10,000.

Trader Calls Pessimism Unnecessary; Urges More Utilization of Surpluses

The continued restriction of private aircraft production has resulted in unnecessary pessimism regarding a declining market for aviation products, according to R. V. Trader, vice president of Aviation Distributors and Manufacturers Association.

According to Trader, 1945 will represent a period in which operators all over the country will have an opportunity to prove that they have sufficient sales ability to cope with immediate conditions and come up with profits in their pockets. The operators should be encouraged and challenged to continue their efforts, rather than be discouraged with talk of a declining market, he said, adding that many sound purposes still exist which permit the full use of surplus aircraft, providing sufficient effort is exerted by the operators to promote and increase flying. He suggests that many surplus airplanes are still available—however, some operators may have become too critical with visions of postwar airplanes in mind. Some operators will not own certain types of airplanes because of their own personal preferences, whereas other operators regard these same ships as of outstanding merit for their operations. "Operators would do well to not only sell the use of aircraft they personally prefer, but contemplate the use of aircraft with a view towards customer's preferences, and be guided by the success other operators are having in the operation of the various makes of aircraft available," Trader said.

REVENUE vs. COSTS

(Continued from page 60)

figures exclude international traffic conducted by Pan American as a Naval auxiliary.

Over-all activities at San Francisco Airport during the current year for air carrier and affiliated activities resulted in employment of over 4,000 civilian personnel with an annual payroll in excess of over $10,000,000.

ESTIMATED EXPENDITURES
Fiscal Year ending June 30, 1945.

Personal Services:		
Permanent Salaries	$59,392	
Allowance for Overtime	872	
Temporary Salaries	3,124	$ 63,388
Contractual Services:		
Travel Expense, Local Fares, Storage and Care of Vehicles	$ 3,648	
Maintenance and Repair of Office Appliances, Miscellaneous Contractual Services, Contractual Window Washing Service	1,075	
Telephone and Telegraph, Postage, Printing, Advertising, etc., Subscriptions to Newspapers and Periodicals	4,760	$ 9,483
Routine Maintenance—General:		
Landing Area, Runways, Taxiways, Aprons, Field Lighting Equip., Parking Areas, Roads, Walks, etc.	$ 2,054	
Radio Equipment, Automotive Equipment, Other Equipment	4,136	
Hangars, Admin. Building, Other Bldgs.	2,290	
Power Distribution Systems	2,121	$ 10,601
Heat, Light and Power:		
Includes electric energy purchased for resale	$34,632	$ 34,632
Materials and Supplies:		
All inclusive	$ 5,331	$ 5,331
Equipment Purchases:		
Mowing Attachment, Trailer Broom, Oil Spreader Equipment, Motor Drive Jointer, Welding Equipment	$ 1,765	$ 1,765
Insurance, Pension, Retirement, Taxes, Etc.:		
Accident, Compensation, Employees, Auto Insurance, Other Insurance (Fire), Pension and Retirement Allowance, Taxes	$23,592	$ 23,592
Services—Other Departments:		
Public Utilities Bureau of Engineering	$ 7,960	$ 7,960
TOTAL		$156,752

Excludes: Bond Redemption, Bond Interest, and Reconstruction and Replacement.

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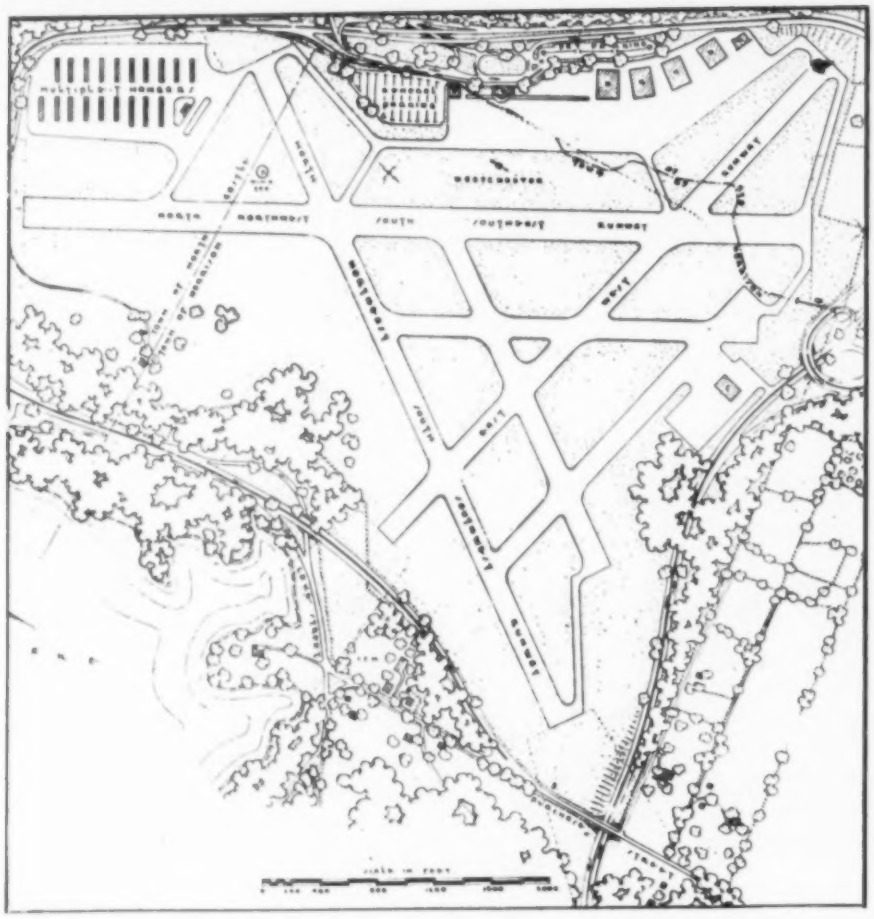


LAYOUT OF WESTCHESTER COUNTY AIRPORT, located twenty-six airline miles from mid-New York and four miles from White Plains, N. Y., is shown in this drawing from North American Airport Corp., which has leased the $4,000,000 field for the duration plus fifteen years. It has two concrete runways and one blacktop runway, all 150 feet wide and being 5,000 feet, 4,750 feet and 4,450 feet in length. It also has 8,900 lineal feet of fifty-foot taxiways, a parking apron and a system of contact lights.

Trade-in Policy Established by Embry-Riddle Covers Plane, Engine, Parts Needing Overhaul

The Embry-Riddle Company of Miami, Fla., has established a trade-in policy for aircraft, aircraft engines, propellers, instruments and accessories. Persons flying into Chapman Field, for example, will be able to have their engine removed, a newly-overhauled one installed and in three hours resume their flight.

Rebuilt carburetors, second-hand magnetos, used engines and all parts will make it possible to reduce maintenance costs, according to the company, which said it expects the aid and backing of the CAA in making it possible for owners to trade in planes and equipment.

The Embry-Riddle Aircraft and Engine Division overhauled engines for the Army Air Forces for over two years. Its large shop is completely equipped for repair, overhaul and maintenance of lightplanes, and contains many special tools and much equipment the company designed and made. One special piece of equipment, for example, is an adjustable cylinder-honing stand, making it possible to hone cylinders and reface valves without removing them from their positions.

Surplus Hangar Doors Offered for Sale

The American Association of Airport Executives has provided the government a list of surplus items suitable for use on airports, according to Pat Moore, secretary.

A number of surplus hangar doors are for sale and are stored in the U. S. Engineers warehouse, Arlington Street, Farmingham, Mass. They originally cost the government $3,891 each, and are described by Secretary Moore as follows:

"Doors, hangar, horizontal sliding, hollow, ten sections, center parting for opening 118-ft. 8-in. wide and 22-ft. 5½-in. high. Top and bottom rollers, belts, bumpers and all other hardware included. Constructed of half-inch-thick fir plywood, pressure glued to 1½-in. by 4½-in. kiln dried dressed fir. Each section prepared for shipment in three 4-ft. wide panels for field assembly. Doors have openings for ¼-inch wire glass. One-inch-thick rock wool blanket covered with paper on both sides is installed between the two layers of plywood. Three-ply cotton webbing furnished for weather stripping. Doors equipped with double race ball bearing bottom rollers, 9-in. machined groove wheels with 1-in. machined cold rolled shaft. Bearings arranged for grease gun lubrication. Top rollers 6½-in. diameter with 1⅛-in. face, equipped with 1-in. cold rolled shaft and double race ball bearings. A coat of water repellent has been applied. Doors designed to withstand 20-lb. wind pressure per square foot. Doors arranged for manual operation."

First Appropriations Sought to Launch Big Pennsylvania Project

Pennsylvania's ten-year $34,500,000 state airport plan would receive a $3,725,000 appropriation for surveys, plans and construction for the first two-year period under a bill introduced in the legislature. The appropriation would be matched by local communities on a fifty-fifty basis.

The plan, prepared by William L. Anderson, director, and the Pennsylvania Aeronautics Commission, provides for 148 new airports and improvements to ninety-five existing fields. When and if a Federal airport project is authorized, Pennsylvania state and local funds would be equally pooled to match U. S. allotments.

$25,000 Voted for Missouri Experiment

The citizens of Eldon, Missouri, have voted nine to one in favor of the $25,000 bond issue to build the first model airpark in America, according to the Missouri Department of Resources and Development. The Eldon Airpark Committee has furnished the aviation industry with information on methods that can be effectively used by other cities and towns in promoting similar airparks. The site for the Model Airpark has been selected, and preliminary work has started.

Maintenance Preparations

Scott Aviation Corporation has announced its complete line of service and maintenance preparations, which are said to be performance-tested and including aviation windshield cleaner, aircraft film remover, polish, metal cleaner and polish, liquid wax, rainproof wax, dope rub, aircraft cleaner, engine tune-up, gasket shellac, thermoplastic gasket sealer, degreaser and "skin cote". The products are available through local chartered Scott dealers, the company stated.

Can you blame us?

Don't get us wrong. As the designers of all gliders operated by the Army Air Forces—and as the builder of many of them—we appreciate the importance of the job they are doing in this war . . . the importance of the role they may play in commercial aviation in the days to come.

But, we don't like combat gliders! Take a look at the youngster above and perhaps you'll understand. He's the pilot of a WACO troop carrying glider and, if you've followed the war and the glider-led invasions, you can readily see that his is a job that makes a man old before his time.

That's why we make this statement. We don't want to see that young fellow—and thousands like him—get old too young. We want to get him out of that glider and into a new, peacetime WACO plane . . . in which all his landings can be happy landings. Can you blame us? THE WACO AIRCRAFT COMPANY, 93 Peters Avenue, Troy, Ohio, U. S. A.

Waco

WACO AIRPLANES

ALL ARMY CARGO-TRANSPORT GLIDERS ARE WACO DESIGNED

AIRPORT EQUIPMENT

Automatic Changers for Coin Service

Automatic coin changers have been perfected by the Vendo Company to be used in locations where self-service automatic vending equipment is placed, or where the burden of change making on an attendant is too great. Airports will find them useful for pay telephones, cigarette machines and other vending equipment. The gadget changes dimes and quarters into nickels.

THOS. D. BROAD
ARCHITECT
For Dallas Air Terminal
Love Field
Burt Bldg. DALLAS R-4768

Lightweight Steel Structural Tower

The Harco "Blizzard King" radio or structural tower, weighing an average member of 5.3 pounds with the heaviest weighing about 8 pounds, has lightweight individual parts and simplified design for easy construction. Bolt and sleeve construction makes possible the erection of these triangular towers, in lengths from 90 to 425 feet, by unskilled labor. The towers are made by the Harco Steel Construction Co., Inc.

Albino Asphalt Used for Camouflaged Bases

"Albino" asphalt is being produced by Shell Oil Company for military air bases. Although it is a deep brown and not white, it is said not to interfere with basic camouflage pigments —light green, dark green, green, olive drab, sand, field drab, earth brown, earth yellow, earth red and loam.

Current Airport Literature

Compiled and Edited
By WILLARD KELSO DENNIS
Librarian, Parks Air College

AIRPORT BUILDINGS: Plan that terminal now, by A. F. Heino. *Air Transport*. 3:22-27. January, 1945.

AIRPORTS—CANADA—EDMONTON: American "Invasion" creates huge modern airport, by J. DeLong. *Canadian Aviation*. 18:78, 118. February, 1945.

AIRPORTS—U. S.: The airport of the future, by R. M. Cleveland and L. E. Neville. In their *The Coming Air Age*. Whittlesey House, 1944. p. 236-264. Creating demand for airports, by R. H. Wood. *Aviation News*. 2:50. January 22, 1945.

AIRPORTS—U. S.—FORT WAYNE (SMITH): How to serve the airport customer, by R. L. Schott. *Airports*. 7:34-35. January,1945.

BUT visibility may be "zero" on bright days due to sun-glare. Everywhere, practical airport managers use tinted, transparent acetate shades to reduce this glare and increase operator efficiency. These shades are durable, non-inflammable and convenient. Write or wire for sample swatch prices and more complete information today.

Transparent Shade Company
501 North Figueroa Street • Los Angeles 12, California

AIRPORTS—U. S.—MICHIGAN: Michigan's airport program, by F. M. Reck. *Aero Digest*. 48:74-76, 218. January 15, 1945.

AIRPORTS—U. S.—REDMOND, OREGON: How we got our airpark, by M. E. Brown. *Plane Talk*. 3:14-15. January, 1945.

AIRPORTS—CONSTRUCTION: Airpark surfacing. *Air Tech*. 6:40, 66. February, 1945. Building the small airport, by R. C. Blatt. *Aviation Maintenance*. 3:48-50. January, 1945. Role of the China ASAC engineers, by R. W. Kirschbaum. *Aero Digest*. 48:56-57. February 1, 1945. The Royal Engineers construct an all-weather airstrip in brick. *Aeronautics*. 12:32-36. February, 1945.

AIRPORTS—DESIGN: Airport trends, by P. H. Stafford. *Canadian Aviation*. 18:102-104. February, 1945. Forty-eight instrument landings an hour, by J. D. Henry. *American Aviation*. 8:68-72. February 1, 1945.

AIRPORTS—DRAINAGE: Building the small airport, by R. C. Blatt. *Aviation Maintenance*. 3:48-50. January, 1945.

AIRPORTS—GOVERNMENT AID: Airports for everybody, by J. C. Ross. *Flying*. 36:40-42, 126. March, 1945. Building main streets for America's aviation. *Aviation*. 44:110-111, 241. January, 1945. Here is the national airport plan. *Airports*. 7:28-31. January, 1945. Our federal airport program, by T. P. Wright. *Air Pilot and Technician*. 33:4-6, 33. January, 1945.

AIRPORTS—LAW: Legal notes on air transportation, by George Boochever. *Air Transportation*. 5:56-57. December, 1944.

AIRPORTS—MAINTENANCE AND REPAIR: Airport maintenance. *Modern Airports (Southern Flight)*. 1:52, 54. February, 1945.

AIRPORTS—MANAGEMENT: Airport discipline means safety, by R. J. Curry. *Flying*. 36:41, 114. February, 1945. Airport merchandising, by D. M. Steele. *Modern Airports (Southern Flight)*. 1:55, 58. February, 1945. City Hall control of municipal airports, by J. H. Frederick. *Modern Airports (Southern Flight)*. 1:51. February, 1945. Evaluating airport costs in dollars and sense, by Raymond Nathan. *Modern Airports (Southern Flight)*. 1:50. February, 1945. How to serve the airport customer, by R. L. Schott. *Airports*. 7:34-35. January, 1945. Service builds sales, by Sidney Nesbitt. *Airports*. 7:32, 50. January, 1945. Stock control for aircraft repair shops, by J. A. Grundy. *Aviation Maintenance*. 3:53, 116. January, 1945. What's wrong with our airports, by R. V. Trader. *Aviation Maintenance*. 3:74, 104. January, 1945.

AIRPORTS—SURFACING, GRASS: Airport maintenance. *Modern Airports (Southern Flight)*. 1:52, 54. February, 1945. Let your airport go to grass, by Joan David. *Flying*. 36:42-43, 110. February, 1945.

AIRPORTS, MARINE: CAA booklet gives airharbor plans. *Aviation News*. 2:37. January 22, 1945. Flying boat terminals. *Commercial Aviation*. 6:57-59. January, 1945. Glenn Martin's plans for flying boat terminals. *U. S. Air Services*. 30:19. February, 1945.

AIRPORTS, PRIVATE: Opportunities in private airports, by G. B. Eastburn. *Modern Airports (Southern Flight)*. 1:42. February, 1945.

FIRE PREVENTION, HANGAR: Are you buying hangar hazards, by Joe Chase. *Aviation Maintenance*. 3:81, 130. January, 1945.

LIGHTING, AIRPORTS: Maintenance of airport lights, by J. S. Haney. *Modern Airports (Southern Flight)*. 1:43-45. February, 1945.

SNOW REMOVAL: Canadian winters make airport snow removal a prime essential, by E. J. Wilkinson. *Canadian Aviation*. 18:95-98. January, 1945. Snow removal pointers. *Airports*. 7:42-43. January, 1945.

TRAFFIC CONTROL: Air traffic jams controlled. *Weight Engineering*. 2:23-24, 51. Winter, 1944. Forty-eight instrument landings an hour, by J. D. Henry. *American Aviation*. 8:68-72. February 1, 1945. Saint landing system. *Flight*. 47:43. January 11, 1945.

A PATENTED "ROCKING CHAIR"

BY J. FRED HENRY

Publisher of "Skyways" tells how Bell Aircraft developed a method for forming plastic cabin tops for military fighters that eliminates surface defects and improves visibility.

The patented "Rocking Chair" method was used to form the plastic cabin tops on these P-63 Kingcobras, shown here as they are being prepared for fly-away delivery to Russia over the Northern Route.

"BELL AIRCRAFT has made an impressive record in developing new methods—not only for improving the fighting performance of our war planes but also for developing many innovations which have greatly speeded up production. One outstanding example is Bell Aircraft's patented machine for molding its transparent plastic cabin tops and canopies.

"Before 1940, these cabin tops and hatches were made by manual methods, too slow for the tempo of scheduled war production. Four men had to pull a sheet of hot plastic over a cotton covered form. It took time, and impressions from the cloth sometimes appeared in the canopy, impairing clear vision.

"One day it was discovered that if there was controlled, constant movement between the plastic sheet and the mold form, many of these defects could be eliminated.

"Utilizing this principle, Bell Aircraft engineers invented, and patented, a stretch-forming machine which keeps the hot rubbery thermoplastic in constant motion—rocking the form until the sheet of material has reached its proper contour and cooled to its final shape.

"This ingenious mechanical 'rocking chair' turns out plastic cabin tops which are not only accurate in form but also of greatly improved optic quality. By the patented Bell Aircraft method a finished clear top comes off the 'stretcher' every seven minutes and two girls are the sole operators.

"They say that necessity is the mother of invention. During this war, Bell engineers have developed many other time and labor-saving ideas which, like the patented 'rocking chair' have helped advance aeronautical science by decades, making possible improved manufacturing methods not only for war but for peacetime production as well."

★ *Buy War Bonds and Speed Victory* ★

MEMBER AIRCRAFT WAR PRODUCTION COUNCIL...EAST COAST, INC.

BELL *Aircraft*

PACEMAKER OF AVIATION PROGRESS

NIAGARA FRONTIER DIVISION
Buffalo and Niagara Falls, N. Y.
Airacobra (P-39) and Kingcobra (P-63)—Fighters
Airacomet—America's First Jet Propelled Plane
The Bell Helicopter

ORDNANCE DIVISION
Burlington, Vt.
Flexible Gun Mounts and other ordnance materials

GEORGIA DIVISION
Marietta, Ga.
B-29 Boeing Designed Superfortress

© Bell Aircraft Corporation

National Airport Plans Advertising Campaign

The manager of the Washington National Airport, Washington, D. C., is interested in receiving proposals from individuals or firms for some dignified form of advertising which would be of service to the traveling public and at the same time contribute toward the revenue of the Washington National Airport.

Individuals or firms interested in the possibility of such advertising projects were invited to furnish the manager of the Washington National Airport proposals which could be used as the basis for further negotiations.

CAA Needs $30,000 to List Registration Data

Efforts are being made to restore to the CAA budget $30,000 disallowed by the Budget Bureau for compilation of aircraft and pilot data furnished state agencies. Since aircraft and pilots are not registered in states, the state agencies are dependent upon the Federal agency for vital statistics. CAA's own records are inadequate because of manpower and money shortages.

SAE Working to Speed Cargo Ground Handling

As a result of aeronautic activities of the Society of Automotive Engineers, research is developing new methods of air cargo ground handling. Engineer speakers have characterized as "antiquated" the present organization of personnel "along bucket-brigade lines;" paper work which makes cargo rooms reminiscent of boom-time stock exchanges; and grounded-time handling of as little as ten minutes. Human speed limitations are recognized as the chief delaying factor, and research appears headed for changes in plane design, high-speed ground equipment, and mechanization of handling operations.

Prompt Hearings on Airport Plans Seen

Immediate start of hearings on Senate airport proposals is expected, with time-consuming hearings on other aviation matters apparently delayed for the time being. The Department of Commerce has emphasized on several recent occasions the need of promptness in enacting legislation for a national program of airport construction and improvement.

San Francisco Group Named for Planning

Completion of the 1945 membership of the San Francisco Chamber of Commerce's Bay Area Aviation Committee was announced last month by Edward V. Mills, chairman. New members appointed are: Lawrence A. Elsener; Fred L. Ellsworth; Ray I. Hess, Civil Aeronautics Administration; Col. Theodore Matthews, air officer, Western Defense Command; Robert L. Philippi; L. Deming Tilton, San Francisco City Planning Commission; and Col. Errol H. Zistel, deputy chief of staff, Fourth Air Force. Kenneth R. MacDonald, manager of the San Francisco Chamber of Commerce Aviation Department was reappointed Secretary to the Committee.

Work Scheduled for New Chicago Terminal

Construction is planned soon on Chicago's new airport terminal building. The building, one-story high 1,440 feet long and forty feet wide, with connecting waiting rooms for the airlines, will be located at the northeast corner of the field. It will cost $420,000.

Contract for the terminal was to be signed the first of March between Chicago and eight airlines. The latter are to rent 25,000 square feet at $2.00 per square foot for a ten-year period.

CAA Studying Airport Separation Standards

Minimum standards for airport separation have been listed by Charles B. Donaldson, director of airports, Civil Aeronautics Administration, in connection with current study of proposals calling for smaller separation distances. A fourteen-mile separation, center to center, is standard for all airports conducting simultaneous instrument operations. Minimum separations for contact operations are listed as being two-mile radius for Class 1 airports, two and one-half-mile radius for Class 2, three-mile radius for Class 3 and four-mile radius for Class 4 and above.

Co-ordinated Airport Communications Planned

The Kellogg Switchboard & Supply Co., is conducting a survey to determine the best features which an ideal airport crash-alarm and general communications system would incorporate, including all inter-communication systems between tower, weather bureau, airline agencies, public address system and the like. "Our purpose is to make it possible for airport managers to procure a complete and specialized system and eliminate the present problem of procuring the various components piecemeal from a variety of sources," a company statement explained.

Airport Digest Available

An airport digest, newest service of the National Aeronautic Association, reviews current literature in periodicals, industrial and commercial publications and technical books and papers, and digests many items of interest. It also contains original material prepared by the airport consultation staff of NAA on such subjects as planning, design, drainage, paving, turf, soil mechanics, maintenance, operation and management.

Detroit Operations for 1944 Summarized

Detroit City Airport expanded its operations during the year 1944 and stands on the threshold of greatly increasing operations. American, Pennsylvania-Central, and TWA operated interstate airlines from this port, and Central Michigan Airline operated intrastate during 1944. Chicago & Southern, United, Northwest, Pan American, and Trans-Canada Air Lines were granted routes into Detroit, with operations on most of them expected to begin in 1945. This is estimated to bring to nearly 200 the daily schedules through Detroit.

Airline passengers numbered 278,598, an increase of 31 per cent over 1943, with an average of sixty-five daily flights. Mail poundage increased 40 per cent and totaled 48,000,000 pieces. Express increased 10 per cent.

Daily landings and take-offs totaling 725 represented an increase of 40 per cent over 1943. Local civilian flying accounted for 234,841 landings and take-offs, 23,784 were air carriers, 3,516 were military, and 2,602 civilian cross-country operations.

Aircraft hangared at the airport totaled 173, many of which were owned by members of the three CAP squadrons based there. Seven companies operated charter and training operations from the field.

Gross income totaled $225,234.17, but costs were not listed. Plans to accommodate the increase in activity in 1945 call for a three-story administration building. Longer-range plans for the Detroit metropolitan area are now being worked out by the Aviation Planning Authority to indicate the number, size, and location of airport facilities within an area of some 2,500 square miles in southeastern Michigan.

Remote Acetylene Beacons Now Operate 12 Months Without Being Refueled

Remote beacon lights which formerly had to be refilled every two months under hazardous conditions, and which at times were blown out by strong winds are now made to burn for twelve months without being serviced. The equipment laboratory of the Air Technical Service Command has developed the beacons with ten fuel tanks, storing enough gas for one year. They are also protected by baffle assemblies to prevent the pilot lights from being blown out. Operation of the beacon, which consists of three one-cubic foot burners with two constantly-burning pilot lights, is controlled by a sunvalve which turns the beacon on at the approach of darkness and off again at dawn. Purified acetylene gas is used as fuel for the burners.

Press Association, Inc.

Beginning of the End -- of Tokyo

November 23, 1944, a fleet of B-29's lifted itself off the runways of Saipan—first raid of these sky-giants against the Japanese capital . . . a combination of men, machines, and determination that is being, and will be, repeated with increasing size and intensity.

In the spring of 1942, Doolittle's planes averaged 30 seconds over Tokyo. Two and a half years later, the world's mightiest bombers loomed high over the "sacred city", pin-pointed their targets, unloaded tons of bombs, and were away after more than 30 minutes over the city.

This was a light raid — comparatively. Others followed it. Day by day B-29 strength in the Pacific is building up with a slow but steady crescendo. More planes, more bombs, more flights, more destruction.

Boeing has done a masterful job in designing and building these ships . . . as has Wright in the mighty engines that get them there *and back*. And numbered among the thousands of vital parts that go into these great Wright engines are CECO carburetors.

Chandler-Evans is proud of this opportunity to pay tribute to all those men and women who have a part in the success of these superb bombers . . . and is proud that the dependability and quality of its carburetors is such that they have been chosen to do their part, however small, in making it the beginning of the end — for Tokyo.

CARBURETORS FUEL PUMPS PROTEK-PLUGS

CHANDLER-EVANS CORPORATION

SOUTH MERIDEN, CONNECTICUT

CECO

PLANTING BY AIRPLANE

(Continued from page 31)

to develop seed pellets not only for aerial planting but for farmers and gardeners using ordinary methods of planting. Experiments have proved, he said, that 90 per cent of the pellets germinate and grow.

No airplane seeding has been done, he said, but plans call for planting several thousand acres of range lands in the Southwest this fall. He and his associates have been working lately with agricultural representatives of several colleges and universities.

The possibilities for airplane planting are almost unlimited, Dr. Adams believes. Russia is faced with tremendous revegetation problems, for example. He believes the Soviet Union could accomplish in a matter of days, using its military aircraft for aerial planting, what would require months and seasons to do with ordinary planting methods.

"One of the big problems, of course, will be seed production," he points out. "But it isn't as complex as it might appear. For example, public lands will largely require native plant seed, which can be gathered and processed much more expeditiously than food-producing seed. Wild plants are needed to halt erosion from wind and water, preserve irrigation and drainage canals by checking flowage across slopes and level lands, and to preserve moisture throughout our huge range areas. Once growth is started, it will lead to automatic reseeding by nature itself. Wildlife, finding new food and shelter, will thrive, and renew nature's own marvellous cycle of plant and animal production. But to avoid future neglect and destruction, aerial planting will be necessary about every ten years, as experience has proved the disastrous results of allowing range lands and other areas to lie idle for longer periods."

Dr. Adams estimates the costs of airplane planting to be inexpensive, when used on a large scale. He won't quote figures, but points out the savings in time and labor would "more than pay the costs." Use of airplanes in dusting cotton has proved inexpensive in the South.

Success Based on Nature

But there is another reason the former Pennsylvania surgeon believes his latest aeronautical development will succeed.

"Don't overlook the fact that it very nearly duplicates nature," he reminded us. "The idea occurred to me back in 1924 out on the fringe of the California desert. I was living on a ranch and used to spend much time studying the growth of cactus plants. In bare, infertile soil a clump of baby cacti would appear. As it grew, rabbits would nibble at it for moisture. Rabbit droppings thus were left close to its shelter, and soon other tiny plants would sprout. In a couple of seasons the growth would be considerable. I was fascinated and soon concluded that rabbit droppings not only contained seed germs, bereft of chaff and hard coating on which the animal had fed, but provided germination stimulant and insect and rodent repellent. Left in the shelter of a large plant, such as a cactus, these natural seed pellets utilized what little moisture was present, and, needing no long-period deterioration, quickly germinated and began to grow. Perhaps it is easier to understand, after that explanation, how we can almost duplicate nature's original method of processing seed germs into pellets.

"But we have done more. We have actually improved on Mother Nature by using the airplane for planting our seed pellets, and our centrifugal planter, combined with the airplane's speed and altitude, allows us to control the frequency and thoroughness of revegetation." ★ ★ ★

BRITISH POSTWAR PLANNING is developing steadily, with several new lightplanes already announced. Here's one (above) with some incredible specifications—"full four-seater or freighter; 85/90-hp. Franklin aircooled engine; payload 500 lbs.; take-off 105 yards; 105-mph. cruising speed; 380-mile safe range." Known as the "Ace", it is being advertised for only £475, or $1,681.50, in British magazines.

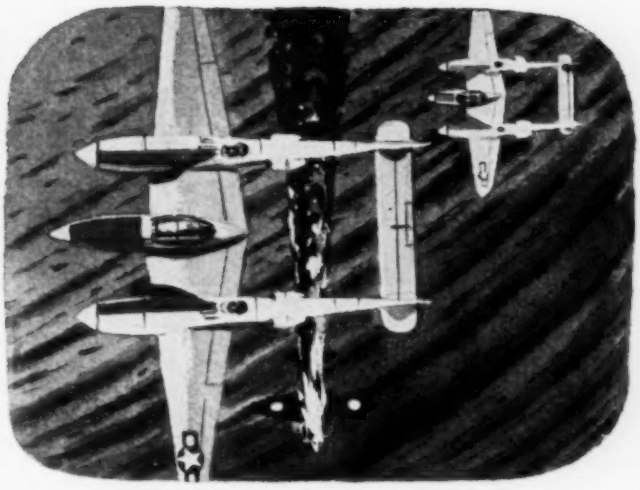
—Lt. Joe James, USNR.

"Well, I see you're still in night fighters!"

THUNDERBOLTS IN BURMA are now escorting RAF bombers operating out of India. This one's guarding a B-24.

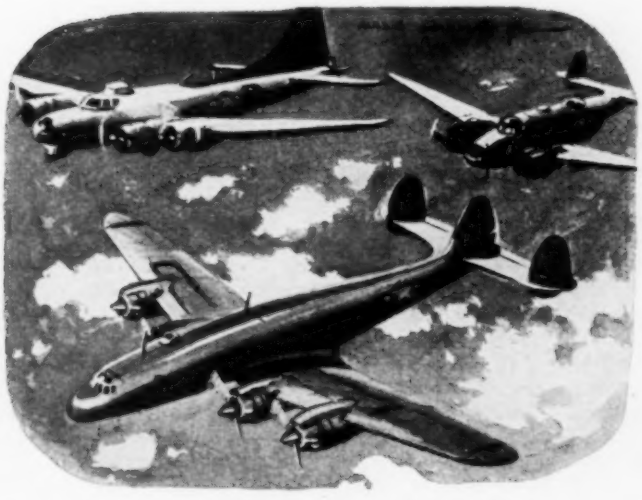
Der Gabelschwanz Teufel

Der Gabelschwanz Teufel, "fork-tailed devil." Named by German pilots who have been lucky enough to escape its wrath. Americans know it as the Lockheed P-38 Lightning – one of the most efficient fighters the world has ever known.



Japs know it, too. In the Pacific, it is probable that more enemy aircraft have been destroyed by the Lockheed Lightning than by any other American fighter. The 49th group alone has a record of more than 537 planes downed in combat.

One of the most versatile of warplanes, Lightnings range far to protect heavy bombers – to photograph military positions. They can blast the enemy with machine guns and cannon, launch rockets, drop bombs or torpedoes, strafe and knock down attackers.



Lockheed builds other great planes for war. The B-17, the Navy PV, a new Army fighter and the majestic Constellation. Each contributes to victory, and each is contributing to the peace when Lockheed will again build planes for commerce and for you.

LOOK TO *Lockheed* FOR LEADERSHIP

Lockheed Aircraft Corporation, Burbank, California

AIR POWER
In Action

By TOM ASHLEY

BECAUSE the United States will be the first target of the next aggressor, it must remain the world's first power in military aviation.

So wrote General of the Armies H. H. Arnold, commanding the Army Air Forces, in his second wartime report to the Secretary of War, issued last month. While the AAF closed in for the final blows to Germany, employing air power on an unprecedented scale, and while AAF units were joined by Navy carrier forces in heavy strategic air offensives against Japan's home industries, General Arnold brought up to date the colorful narrative of the air war which he initiated last year, detailing subsequent air campaigns, their preparation and results. But of great significance this time was his recommendation for postwar AAF strength.

Certain basic principles underlay U. S. air power as it is now being employed and on which its future needs and superiority depend. These principles General Arnold outlined as follows:

"1. Air power is the weapon with which the aggressor in this war first struck and with which future aggressors will strike.

"2. We must recognize that the only certain protection against such aggression is the ability to meet and overcome it before the aggressor can strike the first blow.

"3. The foregoing principles can mean only one thing to the United States. In two world wars, the aggressor has moved first against other peace-loving nations, hoping that the United States would remain aloof, or that other nations could be defeated before this country's power on land, sea, and air could be brought to bear against him. Luckily, in each war there has been time for the mobilization of such power, and the United States has been the determining factor in the defense of civilization. The lesson is too plain for the next aggressor to miss: THE UNITED STATES WILL BE HIS FIRST TARGET. There will be no opportunity for our gradual mobilization—no chance to rely on the efforts of others. It is of the utmost importance that our first line of defense, in the air, must be ably manned and fully supplied with modern equipment. We must be able to provide time for other parts of the national defense machine to mobilize and go into high gear. The United States must be the world's first power in military aviation.

"4. Air power and air supremacy are terms which require careful definition. Their full significance must be understood by the American people.

"5. Thus, the first essential of the air power necessary for our national security is pre-eminence in research.

"6. It must also be fully understood that scientific research and development will not of themselves keep the United States in the lead. . . . All of our present aircraft, our power plants, and many items of essential equipment are in a sense 'obsolete'—in that they are or may shortly be surpassed in utility or performance by other equipment, in the blueprint or mock-up stage, but not yet in production. . . . The American people must never again assume—as after the last war and as the French did up to the break-through in 1940—that numbers of aircraft and quantities of equipment make an air force. A second-rate air force is worse than none because it gives rise to a false sense of security—which bombs may quickly demolish.

"7. Even an up-to-date air force in being may not constitute air power. . . . Segments of industry must be capable of and ready for rapid conversion to quantity production, and certain Government-owned plants and production equipment not subject to rapid obsolescence should be kept in stand-by as a war reserve against the potential aggressor.

"8. Air power must be employed from large, fully-equipped, strategically located bases. Our air forces must be able to meet and overpower the aggressor's air threat as near as possible to its source.

"9. In all-out war the Army tactical air force and the Navy air force teams must work closely together with our Army and our Navy. This can only be secured by actual service together in tactical exercises and maneuvers during times of peace.

"10. We have learned and must not forget that from now on air transport is an essential of air power, in fact, of all national power.

"11. The American people must visualize that the aggressor's blow may be attended by dropping of large bodies of troops to seize our vital centers. Similarly, to assure our security, we must be prepared to counter this employment of the airplane and to employ it more effectively ourselves.

"12. None of these essentials of air power will be effective without adequate trained and experienced personnel."

★ ★ ★

Berlin Bomb Damage

Having received 15,116 tons of bombs from U. S. Army Air Forces alone, Berlin has become the most heavily-bombed target in Europe. That was the total as of Feb. 3.

An official breakdown of the results at Berlin includes

LOSSES IN THE AIR WAR
January 24-February 25
(Does Not Include Probables or Damaged Totals)

	Europe		Italy		Southwest Pacific		Russia*
	Enemy	Allied	Enemy	Allied	Enemy	Allied	Enemy
Jan. 26	....	....	....	3	1	....	36
Jan. 27	....	....	....	8	1	....	18
Jan. 28	1	30	....	2	9	1	16
Jan. 29	13	24	4	7	4	....	24
Jan. 30	....	....	....	9	....	....	40
Jan. 31	....	....	....	13	1	....	26
Feb. 1	6	18	....	5	20	....	26
Feb. 2	3	40	8	7	11	....	21
Feb. 3	44	48	....	1	35	2	30
Feb. 4	....	4	....	10	1	3	56
Feb. 5	....	....	....	7	20	....	21
Feb. 6	4	1	3	2	1	....	26
Feb. 7	12	15	6	34	1	2	30
Feb. 8	3	16	2	19	1	....	55
Feb. 9	69	35	....	5	1	....	70
Feb. 10	....	4	....	1	6	....	26
Feb. 11	1	8	....	6	5	....	43
Feb. 12	....	....	4	3	....	....	12
Feb. 13	2	6	1	15	17	2	9
Feb. 14	20	20	....	8	12	....	25
Feb. 15	13	46	....	4	1	....	39
Feb. 16	1	1	1	22	428	....	41
Feb. 17	3	10	1	10	....	....	88
Feb. 18	....	7	....	1	....	....	84
Feb. 19	10	20	3	14	....	....	109
Feb. 20	53	55	....	11	....	....	67
Feb. 21	4	10	....	25	....	....	80
Feb. 22	63	35	....	23	....	....	14
Feb. 23	21	20	2	10	18	....	34
Feb. 24	5	21	....	9	2	....	8
Feb. 25	59	47	....	20	....	....	31
TOTALS	410	641	35	314	596	10	1205
Totals since Jan. 1, '45	1053	1165	57	479	1078	43	2008

*RUSSIA: Does not reveal own losses.
CHINA: Seventy-two enemy planes destroyed at loss of twenty-three. Totals since January 1, 451 enemy, 56 Allied.
PACIFIC: Six hundred sixty-four enemy planes destroyed at loss of seventy-eight. Totals since January 1, 1,200 enemy, 142 Allied.
SOUTHEAST ASIA: Seventy enemy planes destroyed at loss of fifty-three. Totals since January 1, 81 enemy, 67 Allied.
(NOTE: These figures are compiled by SOUTHERN FLIGHT from daily headquarters communiques issued by the respective commands. They are, therefore, subject to periodic adjustment. Dates for Southwest Pacific are those on which figures are released; others when action occurred.)

Finish the Fight – with War Bonds

Skyscraper

Stand where you can look at one single part of the Boeing B-29 Superfortress . . . the huge tail, tall as a three-story house. High above you are the deadly hooded guns and the tail gunner's compartment of bullet-proof glass. Horizontal tail surfaces reach out on either side, wider than the wingspread of what was once considered a good-sized airplane.

Size alone is not the remarkable thing about the B-29, however; there have been big airplanes before.

But there has never been a plane that would carry as heavy a bomb load so far, so fast, so high.

Nor has such an airplane ever before been successfully designed, tested, and manufactured in quantity . . . in time to get into action *during* a period of war!

Boeing measured up to this stupendous task which included engineering the B-29 so that it combined high-performance characteristics with great load-carrying ability; and manufacturing it on a scale never before thought possible for so large and potent an aerial weapon.

This latter meant the blazing of new trails in tooling and production planning. It meant the originating of completely new facilities and processes. It meant not only the making of the manufacturing plan and putting it into operation in Boeing's own plants, but assisting the other aircraft manufacturers, which were chosen by the Army to help Boeing build the B-29's. And it meant doing all these things while the Superfortress itself was still in the development stage!

Today the Boeing Superfortresses are taking their place alongside the famous Flying Fortresses as a great fighting team. They represent Boeing's effort to provide American Air Force crews with the best possible weapons for performing their vital and hazardous missions.

Tomorrow Boeing research, design, engineering and manufacture will be applied to peacetime airplanes for your use . . . your assurance that any product "Built by Boeing" is bound to be good.

DESIGNERS OF THE B-29 SUPERFORTRESS • THE FLYING FORTRESS • THE NEW STRATOCRUISER
THE KAYDET TRAINER • THE STRATOLINER • PAN AMERICAN CLIPPERS

BOEING

The WORLD'S WINGS

By LUCIEN ZACHAROFF

WHEN the Hitlerites in their utmost effort to save themselves had mobilized the entire not inconsiderable resources of German science and technology, their latest defensive weapons consisted of jet-propelled aircraft, while their new offensive tools were the flying bomb and the big rocket. There was a common theoretical principle in their supreme bid for survival.

Had the new Nazi arsenal come into play a year earlier, when its perpetrators controlled the Channel coast, its use would have delayed liberation of Western Europe. (One of the principal reasons why jet propulsion and rocketry did not flourish over the Continent when Eisenhower invaded in June, 1944, was that Allied air power had played havoc with German factories, production schedules, and construction programs.)

Nevertheless, the German failure—a unique blend of military, political, timing factors—contains much instructive material for the future of both combat and civil aircraft. For jet propulsion and the allied rocket principle are generally conceded to be destined for huge improvements and the widest application. It should not be surprising, for instance, if a preponderance of United Nations fighter planes at the finish of the war in the Pacific were jet-propelled. Commercial opportunities, a few years after the war, are vast.

Messerschmitts Are Leaders

Because of these considerations we have watched avidly for whatever information could be gleaned on the shape of things to come. Among other things, we have been intrigued by the operating German j-p craft whose designations we have known but whose details remained largely shrouded. Now it is possible to disclose significant data about some of these enemy weapons and also certain important basic conclusions reached about them by most authoritative Allied specialists.

The two foremost Nazi j-p planes have both been Messerschmitts Me-262A and Me-163B. The former is powered by two Junkers Jumo 004 turbo-jet units, prominently underslung. A low-wing monoplane with swept-back square-cut wing and high-set tailplane, it is used as a fighter-bomber and ground-attacker. It has a tricycle undercarriage and four 30 mm. guns in the nose. Its span is about 41 feet and length 35-36 feet, endurance up to two hours. The maximum speed is 475-500 mph.

Me-163B mounts a bi-fuel rocket propulsion unit and is a mid-wing monoplane. The wing is sharply swept-back and has square-cut tips. The large square-cut fin and rudder merge with the tail wheel fairing below fuselage; no tailplane is fitted. There is a skid for landing; the wheel undercarriage is jettisonable. The plane is an interceptor with a high rate of climb and an endurance of a few minutes under power; this may be extended by intermittent periods of gliding. The approximate span is 31 feet, length 20 feet, maximum speed well over 500 mph.

Of the two aircraft, the 262 has proven more important. Its supreme advantage is speed. But like other super-fast planes, it has a low maneuverability and a very high landing speed. Hence, it is hard to handle and demands first-rate pilots. Very bad is its short range limited by the j-p unit's fuel consumption per minute —four times that of the conventional fighter engine.

Why, then, did the Luftwaffe resort to this plane? Obviously because the most effective conventional German fighters had failed as interceptors to prevent the great escorted U. S. day sweeps over the Reich. Most likely the 262's were especially slated for daytime defense to inflict prohibitive losses on the American attacking Central Germany's huge synthetic-oil plants.

Employed as a fighter-bomber, the 262 has flashed over the front at 500 mph., seeking out targets on the Allied side. Some effectiveness on this score can be granted, but its bombing can hardly be described as precision. On a limited scale it has also attempted to counter Allied fighter attacks.

Lastly, the 262 has been used for reconnaissance which must be tactical owing to its short range. It is agreed by our informants that its greatest contribution has been in this realm.

Glider With Rocket Engine

Even stranger and more interesting in design, though less important practically, is the Me 163. It is not, strictly speaking, a jet plane at all; rather, it is a man-carrying rocket with a pair of wings slapped on. The operating principle is closest to that of the large German V-II rocket.

Hitting nearly 600 mph., it carries only enough fuel to feed its so-called engine for seven minutes, consuming fuel at about fifty times the rate of a normal fighter! It would be utterly useless as a warplane if it remained in the air for but seven minutes. So, its pilot fires himself into the air by means of what in any other country would be called a near-catastrophic explosion, then stops the rocket, and cruisers like a glider.

A tiny bat-like thing, the 163 in favorable circumstances floats about the sky for a considerable period without resort to power, losing altitude very gradually. Espying an enemy bomber formation, it switches on the rocket and makes a dash for the heavies at 600 mph. Thus far the extraordinary little object has met with indifferent success, and fewer specimens have been sent into action lately.

Sober-minded scientists with a long-term viewpoint see a future for such a machine. Its true rocket propulsion enables it to climb faster than any other. Its efficiency does not fall off but rises sharply with altitude. The thinner the air, the faster it goes, since, unlike a true jet unit, it does not depend on sucking in and pushing out air; nor does it need air for the propeller or super-charger to grip on. Thus, its great ultimate future is in the stratosphere.

Commercial aviation needn't ignore jet propulsion and rocket opportunities just because the German militarists and politicians have so far failed to make the most of these gifts of the German scientists. ★ ★ ★

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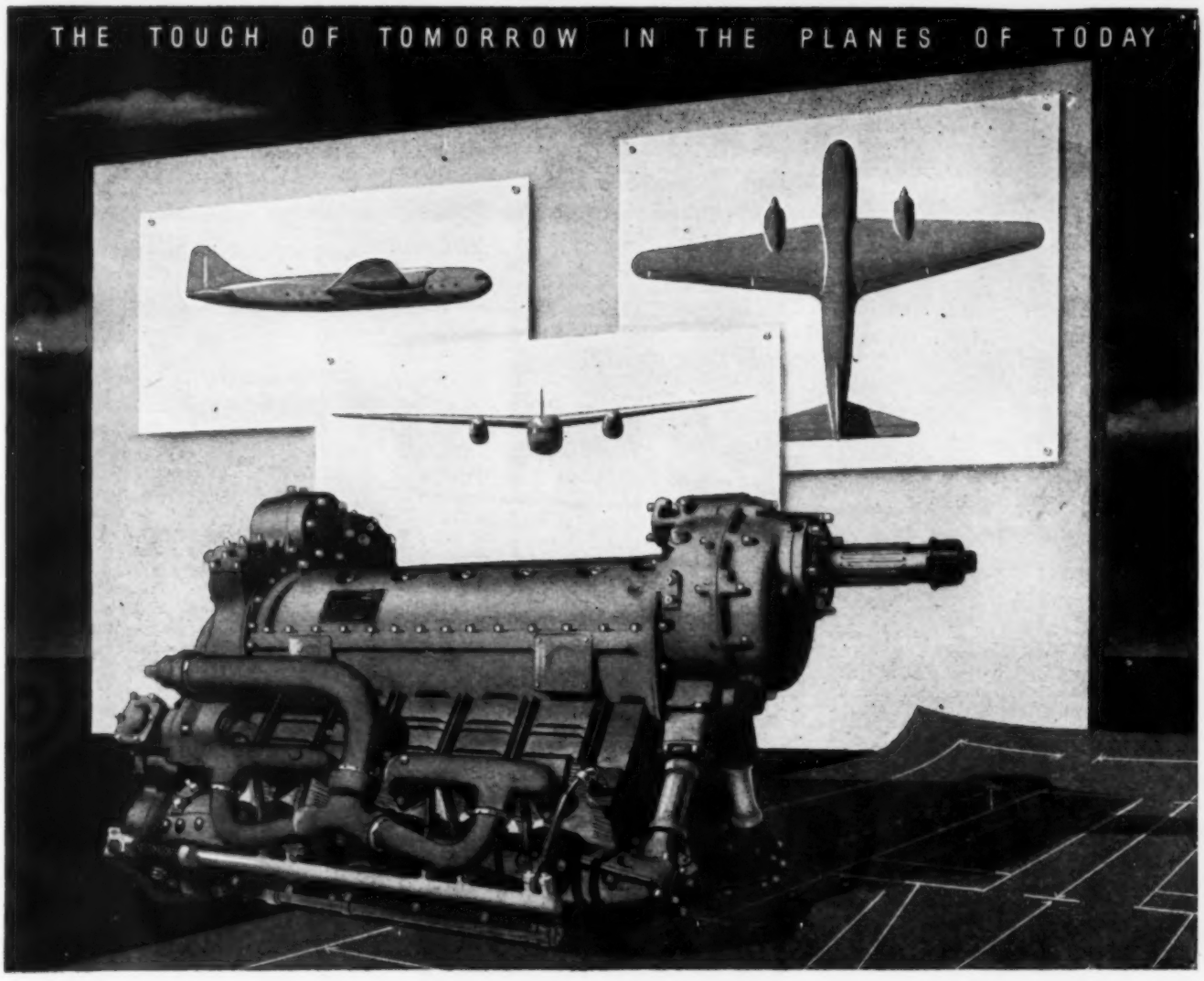
these itemizations: Spandau aero-engine works and ordnance depots received 691 tons; Tegel tank plants, 641 tons; Marienfelde aero-engine plants, 271 tons; Niederschenweide tank plants, 223 tons; Nowares marshalling yards, 42 tons; Zehlendorf marshalling yards, 42 tons; Tempelhof marshalling yards, 36 tons, and Templin marshalling yards, 88 tons.

Other European cities heavily bombed by the AAF, with the number of tons dropped, include Munich, 12,672 tons; Vienna, 12,310 tons; Cologne, 11,466 tons; Merseberg, 10,528 tons; Brunswick, 9,431 tons; Ludwigshafen, 9,412 tons; Frankfurt, 9,313 tons; Kassel, 9,102 tons; Hamm, 8,624 tons; Hamburg, 8,387 tons; Budapest, 7,007 tons; Koblenz, 6,763 tons; Saarbrucken, 6,738 tons, and Muenster, 6,343 tons.

To determine full extent of damages to various targets in Germany, special missions of experts are following ground forces as they advance into the enemy homeland.

At the last count, as of January, England's Royal Air Force had dropped more than 10,000 tons on each of thirteen German towns—Berlin, Essen, Cologne, Dusseldorf, Stuttgart, Hamburg, Frankfurt, Kiel and Hanover. ★ ★ ★



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Production Plagued by Manpower and Material Shortages

Pressure for increased aircraft production intensified during February, with growing tenseness in manpower and material shortages indicating continued decreases in production March and April.

Aircraft production had failed to meet January schedules by 4 per cent, but were 1 per cent above December, and critical aircraft models were 13 per cent below first-of-the-month schedules. It is in critical models that demands are rising sharply, and by July 1 gains ranging up to a high of 260 per cent over last December's levels must be registered. Last month jet propulsion engines and two additional aircraft models, not identified, were singled out for "critical" classification in the drive for more production.

Selective Service calls on the aircraft industry became serious when deferred men under thirty, most of whom occupy key positions affecting future production, were reclassified for induction.

Raw material production, particularly in aluminum, continued to affect future schedules, and mill orders for the coming months were piling up.

February production figures were not complete as this issue went to press, but were expected to fall short of January's output of 6,535 airplanes. In January three fighter plants and one light bomber factory missed their schedules so badly as to account to a large degree for the over-all deficit.

AiResearch Develops Pressurized Control System for New Army Fighter

New developments by AiResearch Manufacturing Company include a complete pressurized control system for a new secret Army pursuit ship, an aluminum oil cooler, A-26 and B-29 actuators, two new type cabin pressure regulators and the new D-9 four-port oil cooler valve. Total 1944 production by AiResearch was reported up 100 per cent over 1943. Approximately 130,000 oil coolers, 50,000 intercoolers, 30,000 actuators and other electrical controls, 4,000 pressure regulators and 110,000,000 copper and aluminum tubes were completed and shipped during the year.

New 700-hp. Wright Engine Announced

A new seven-cylinder Wright Cyclone engine developing 700 horsepower and designed for low-octane fuel has been announced as Wright Aeronautical Corporation's bid for short-haul air transport power plant business. It was described by President Guy W. Vaughn as being of the same basic design of other Wrights with distinctive combustion chambers. Many of its parts are interchangeable with those from Cyclone 9 engines.

New Panel Simplifies Armament Control Switches

A standardized control panel simplifying cockpit operation of machine gun, bomb, camera, chemical tank and rocket switches, has been devised by the AAF Air Technical Service Command and North American Aviation, Inc., for the P-51 Mustang. It is expected to be adapted to other types.

Buick Building Two New P. & W. Engines

Buick Motor Division of General Motors Corporation is producing two new-type engines; a 1,830-cubic-inch displacement, fourteen-cylinder Pratt & Whitney Twin Wasp for B-24 Liberators and a 2,000-cubic-inch displacement fourteen-cylinder Pratt & Whitney Twin Wasp for Douglas C-54's.

GM Produces 9,000 Planes, 180,000 Engines

General Motors Corporation has released figures showing it has produced more than 180,000 airplane engines and more than 9,000 complete bombers and fighter planes since 1940. C. E. Wilson, president, said that among other new items, the corporation is manufacturing radar equipment, rocket bombs and jet propulsion engines.

INFLATION SIMPLIFIES installation of aircraft wiring in plastic tubing at North American Aviation's Dallas plant, where compressed air does the job of inflating. —(NAA Photo.)

Aluminum Ingot Output Upped by Four Mills

The War Production Board has called for a 10,000,000-pound increase in monthly aluminum ingot production by four plants where operations had been curtailed. The plants are the Aluminum Company of America's mills at Massena, N. Y.; Badin, N. C.; and Niagara Falls, N. Y., and the Defense Plant Corporation plant at Spokane, Wash. At the same time, WPB reported aluminum sheet mills would be allowed to accept additional orders for April and subsequent months. Production of sheet has increased since the first of December from about 55,000,000 pounds to a rate of about 80,000,000 pounds monthly.

Kansas Delivers 1,000th B-29 to Army Air Forces

The 1,000th B-29 has been produced and delivered to the AAF at Wichita, Kansas, by Boeing Airplane Company. The company also delivered its 10,346th Kaydet primary trainer, built at Wichita's Plant I, now converted to B-29 production. Since Pearl Harbor this plant has delivered 44 per cent of the primary training planes used by the Army and Navy while fourteen other aircraft manufacturing firms combined turned out the other 56 per cent. The Boeing Kaydet was the first primary trainer to be completely standardized for both the Army and Navy.

570 Mustangs Built in January at Inglewood

North American Aviation, Inc., set a new national production record for a single type airplane from one plant by producing more than 570 P-51 Mustangs in January at Inglewood, Calif.

B-32 Modification Added at Ft. Worth before Plane Enters Training or Combat

Although the B-32 has not been announced in training or combat, a new Consolidated Vultee Aircraft Corporation department, B-32 Modification, has been created at the Fort Worth division, with Howard S. Kittel, formerly assistant plant engineer, as superintendent.

"Activities of the new department will be expanded to care for changes on the B-32 Dominator as a result of training and combat experience," C. A. Sharpe, works manager, said.

63-lb. Data Kits for Texas-Made B-32's

A technical data kit made for the B-32 at the Fort Worth division of Consolidated Vultee Aircraft Corporation consists of twelve volumes, weighing sixty-three pounds. There are 2,343 pages, 389 numerical drawings, 935 blueprints and 270 pages of electrical and wiring diagrams.

Beisel, Woodhead Lead National Aircraft Council

Rex Beisel, general manager of the Chance Vought division, United Aircraft Corp., is the new president of the National Aircraft War Production Council, and Harry Woodhead, president of Consolidated Vultee Aircraft Corp., is the new vice president. At the same time, Woodhead became president of the West Coast Council, and Beisel heads the East Coast Council. Richard C. Palmer has been made general manager of NAWPC with headquarters in Washington.

AAF Technical, Materiel Merger followed by Sharp Labor, Pay Savings

Personnel has been reduced by 18,000 persons at the Air Technical Service Command, and the payroll by $2,000,000 a month, or five per cent, since consolidation last September of the AAF Materiel Command and the Air Service Command into the ATSC, according to Lt. Gen. William S. Knudsen, ATSC director. Aircraft schedules have been met 98 per cent. The ATSC plant investment amounts to $622,000,000, and it handles 341,000 tons of parts per month; the Command repaired or overhauled last month 697 airplanes, 15,758 engines and 306,826 accessories, according to General Knudsen.

Big Martin Gift to Spur University Research

An initial gift of $1,700,000 has been given to the University of Maryland by Glenn L. Martin for the establishment of a college of aeronautical education and research, and the endowment of the Glenn L. Martin Aeronautical Research Foundation. In addition, $750,000 in state funds will be added for construction work, making a total of $2,450,000. Of the total amount, $1,500,000 will be spent for construction of facilities and $200,000 will be used to set up an endowment for the Glenn L. Martin Aeronautical Research Foundation. Martin plans to increase the amount in the future.

New Training Guide for Contract Settlement

A new Contract Settlement Training Guide has been published by the Contract Settlement Advisory Board's committee on training to prepare war contractors for handling contract settlement. The booklet is designed to provide basic information for termination coordination committees, which have charge of local contractor training programs. It gives the contractors actual practice in filling out settlement proposal forms and solving practical problems dealing with the subject.

Contracts Given Amer. Prop.

New contracts have been awarded to the American Propeller Corporation, Toledo, Ohio, by the AAF Air Technical Service Command for additional propellers for Army and Navy planes. One contract covers blades for the Bell P-63 Kingcobra and volume production began in February. The other contract involves blades for use on two of the Navy's latest planes—a fighter and a Curtiss Scout plane.

Strain Gage Conference Held at Texas University

A testing exhibit and electric strain gage conference for the Louisiana, Texas and Oklahoma area was held at the University of Texas the first part of February. The conference showed the latest technique and equipment, and provided time for consultation about individual problems.

Rocket-Motor Carriage Launches Robot Bombs

Monsanto Chemical Company will produce rocket-launching motors as well as manufacture the launching propellent chemical for American models of the robot bombs. The rocket motors, resembling open-end bombs, are installed on carriages and are used to get robot bombs off the ground and to build up momentum needed to start the jet propulsion motors. The carriage and its rocket motors fall to the ground after sufficient speed is attained.

Half-Millionth HS Propeller Produced

The 500,000th propeller has been produced by Hamilton Standard Propellers division of United Aircraft Corporation. This number represents more than 75 per cent of the total propellers installed on the nation's planes from advanced trainers through heavy bombers. In the course of making the propeller, the company and its licensees have now built more than 1,600,000 blades.

Consolidated Vultee Sales Near Billion-Dollar Mark

A net income of $12,424,313 or $8.80 per share has been reported by Consolidated Vultee Aircraft Corporation for the fiscal year ended November 30, 1944. This was after deducting $6,500,000 for postwar readjustment, equivalent to an additional $4.70 per share of common stock. Sales of the corporation in 1944 totaled $960,016,945, and the corporation exceeded all previous records in pounds of airplanes produced, with 131,000,000 pounds being delivered. The report pointed out that the corporation was engaged in the manufacture of several new airplanes about which details could not be given because of military restrictions.

Thomas Heads APMA

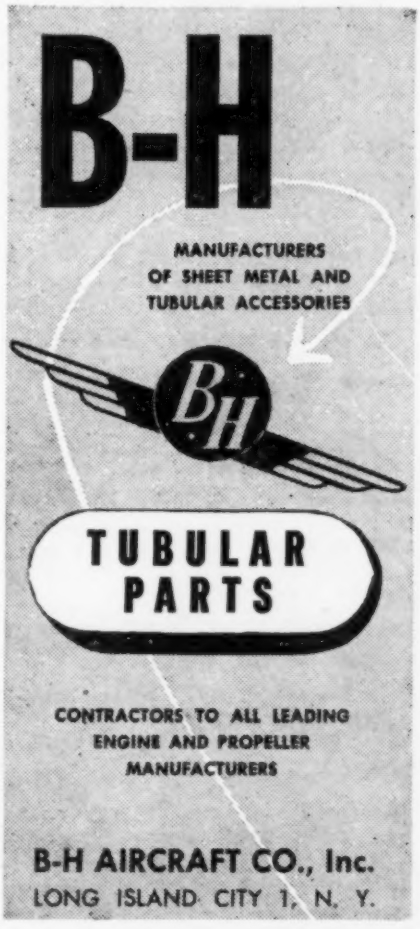
Hayward C. Thomas, president of Clarke-Aero-Hydraulics, Inc., of Pasadena, has been elected 1945 president of the Aircraft Parts Manufacturers Association, succeeding T. T. Arden. F. W. Wilkins, of United Aircraft Products, Inc., was elected vice president; J. D. McDonald, McDonald Manufacturing Company, secretary; and Ralph Middleton, Aireon Manufacturing Company, treasurer.

AAF Conserving Rubber

A big-scale drive to conserve rubber has been started by the AAF, according to Lt. Gen. William S. Knudsen, director of the Air Technical Service Command. The ATSC has been charged with the responsibility of co-ordinating the rubber conservation activities of all AAF commands and air forces.

Accident Rate Slashed

Douglas Aircraft's Santa Monica plant attained a 67 per cent reduction in industrial accidents in 1944 because of safe practices, new protective devices, sound worker program and the efforts of the volunteer fire and safety group. The low in accidents is one-third that of the 1943 total. During 1944, 42,221 man-hours were saved.



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PERSONALS

WILLIAM L. WILSON has been elected vice president, and DR. ROBERT LIVINGSTON JOHNSON, president of Temple University, has been elected member of the board of directors, of Kellett Aircraft Corp. . . . LEON H. JOSEPH has been named treasurer of Freedman-Burnham Engineering Corp. . . . EDWARD C. WELLS, chief engineer of Boeing Aircraft Co., has been selected as the 1944 winner of the Fawcett Aviation Award for his work in advancing long-distance flights as embodied in the B-17, B-29 and the C-97. . . . ALEXIS R. STOCKER, director of foreign relations for Fairchild Engine and Airplane Corp., has been granted a six months' leave of absence. . . . GUNNAR ERICKSSON will take Stocker's position.

MYRON H. BUEHRER, former sales manager, has been named general manager of the Boice-Crane Co. . . . HOWARD HOLMES has been named sales manager, and RUSSELL NEWCOMB has been named sales promotion and advertising manager of Simmonds Aerocessories, Inc. . . . Institute of the Aeronautical Sciences has announced three 1944 award winners, with FRED E. WEICK, chief engineer of Engineering and Research Corp., receiving the Sylvanus Albert Reed award for his contribution to the development of tricycle landing gear and two-control, non-spinning airplane, COL. BENJAMIN S. KELSEY, AAF, receiving the Octave Chanute award for outstanding contributions to the development of high speed military aircraft, and the knowledge of the effects of compressibility through flight testing; WILLIAM H. PHILLIPS, NACA, receiving the Lawrence Sperry award for his contributions in the field of stability and control of aircraft, and JOHN CARY BELLAMY, AAF weather service, receiving the Robert M. Losey award for his contributions in the field of meteorology as applied to aeronautics.

DONALD S. SPRAGUE, new head of Turco Products, Inc., aviation department, was formerly with Douglas Aircraft Corp. . . . L. V. BEDELL has been appointed manager of Sperry Gyroscope Company's electronics plant. . . . ERNEST KANZLER, chairman of Universal C. I. T. Credit Corp., and M. P. FERGUSON, vice president of Bendix, have been elected to the board of directors of Bendix Aviation Corp. . . . WILLIAM R. ROBBINS has been named general accountant of United Aircraft Corp., succeeding FREDERICK E. BURNHAM, who resigned.

JAMES F. GOOD is now factory superintendent of Consolidated Vultee Aircraft Corporation's Miami division. . . . HUBERT C. WATSON is now associated with Walter Dorwin Teague, industrial designer, as consultant on aviation design. . . . E. JOSEPH BABKES has been appointed purchasing agent for Lear, Incorporated. . . . WALTER K. BALCH has been appointed airplane service manager and head of the flight service organization of Ryan Aeronautical Co. . . . HELMUTH G. BRAENDEL has been appointed chief engineer of Wilkening Manufacturing Company.

Bendix Names Foreign Operations Co-ordinator

Charles T. Zaoral has been appointed co-ordinator for foreign operatoins of Bendix Aviation Corporation, according to Ernest R. Breech, president of the company. Zaoral will supervise matters relating to the licensing in foreign countries of products developed by Bendix, together with sales for export and studies of possible Bendix manufacturing operations in the foreign field.

B. A. (BUD) GILLIES, vice president of Grumman Aircraft Engineering Corp., for the last ten years, has become assistant to the president and director of flight and service of Ryan Aeronautical Co. Widely known for his major contribution to Grumman's remarkable success in engineering and production, Gillies has undertaken a key role in Ryan's new project for production of a secret Navy fighter.

P-51's To Be Built by Australian Firm

Australia has been granted license to produce the P-51 Mustang fighter by North American Aviation, Inc. Complete sets of component parts, subassemblies and accessories have been provided under the licensing agreement. The Commonwealth Aircraft Corporation at Melbourne, already building North American's AT-6, will build the P-51.

UAC Shipments Increase 10 Per Cent Over 1943

United Aircraft Corporation's shipments of aircraft, engines and propellers increased 10 per cent in the first nine months of 1944 over the corresponding period in 1943. Net income before renegotiation and earnings on common stock increased 5 per cent during the period, according to a recent release of the third quarter statement. This included the operating divisions of the company: Pratt & Whitney Aircraft, Hamilton Standard Propellers, Chance Vought Aircraft and Sikorsky Aircraft. Shipment for the third quarter by the company amounted to $161,084,331; the net income was $4,123,650. The nine months' total was $581,010,146 for shipments, and net income was $12,573,763.

"Focal Painting" Aids Consolidated Production

Focal painting has been instituted at the Fort Worth plant of Consolidated Vultee Aircraft Corporation on the machines, switches, cranes and fixtures to lessen eye fatigue, aid morale and reduce accidents. In the tool room, the bodies of the shapers, millers, planers, borers and drills are painted in Vista green. Critical operating parts of the machines are painted in ivory. Control switches are in orange. Operating levers and cranes are in yellow.

NEW PRODUCTS

Baby Saw Rips Metal

A Cleco Pneumatic Baby Saw, for ripping metal sheet to 3-16-inch thick, has been announced by the Cleveland Pneumatic Tool Company. The new saw is effective on steel, brass, aluminum and other metals, and cuts 1-16-inch steel at the rate of one inch per second, on a straight or curved line. Edges of the cutting will be free from burrs. The new saw is manufactured of a special steel especially heat-treated for the work, and weighs 2¾ lbs. It is about eight inches long. A bulletin on the saw may be obtained from Cleveland Pneumatic Tool Company, 3781 East 77th St., Cleveland, Ohio.

Reversible P & W Gage

A new reversing feature for electrolimit height gages manufactured by Pratt and Whitney has been added. The new head carries a small lever which permits setting the gage for measuring up or down, instead of one direction as before. The new device may be furnished with indicator and either of two stands, or the head may be purchased separately. Owners of the previous model may substitute the new head without replacement of stand or indicator. The new reversing height gage operates on the basic principle of translation of mechanical movement into electrical magnification which produces sensitive results on precision work, as do all P & W electrolimit gages, the company said.

Computer for Pilots

Development of a new radio range orientator and turn and heading computer has been announced by Aviation Associates, Chicago, Ill. The new features include bisector heading, drift corrections, heading to fly to reach the nearest beam leg when getting a fade-out signal, headings to fly during turn-around procedure on each beam leg, ship-to-station bearing and station-to-ship bearing. The new orientator has four arms which can be set to coincide with the published beam bearings. The unit, suitable for student or advanced use, was designed by A/S John R. Dean of the ATC.

Plastic Clips for Cables

Plastic cable clips are being fabricated by the Commercial Plastics Co., a division of Dow Chemical Co., Midland, Michigan. Advantageous as fasteners for wires, cables and hydraulic lines in the electrical, automotive and aviation fields, they are non-conductive, lightweight, strong and resistant to acid, oil and alkali. Rolled edges and the abrasion-free nature of plastics prevents wear-off of insulating materials, it is said.

Hot-Dip Tanks

A new hot-dip plastic coating tank has been announced by the Aeroil Burner Co. It was designed for treatment of small tools, gages, dies and other small objects, and is built on the double-boiler principle, electrically heated with a 1200-watt immersion element.

Convertible Welding Sets

Westinghouse Manufacturing Corporation engineers have made it possible to convert 1000-ampere alternating-current welding sets used with automatic machines in fabricating large-thick-plate war equipment to manual service, should a decrease in the need for automatic welding occur. With the device, the welder can be converted to serve as a power supply to six individuals, manual welding operations, each having a current range of 45 to 270 amperes. This welder-conversion device consists of a transformer and a group of six reactors which are fed by the welding transformer. The transformer steps the normal operating open-circuit down to 75 amperes, more suitable for manual welding.

Shockproof Drop Container

A new "Sky-Hook" drop container manufactured by the Stack Plastic Company, Culver City, California, is said to land ammunition or supplies without damage. Made of fiberglass and plastic, the new container has a wing like blade attached to the container and spins earthward in the manner of a maple seed pod. Light in weight and tough enough to assure shockproof dropping, the "Sky-Hook" is made with six layers of canvas and fiberglass.

New Type Stainless Steel

A new type of stainless steel will soon be perfected which can be substituted for duralumin in aircraft, according to A. L. Field, director of the research division of the Rustless Iron and Steel Corporation in an address to the Muncie chapter of the American Society for Metals. This particular structural use of stainless steel must await full development of a precipitation-hardening type which can be hardened at relatively low temperatures.

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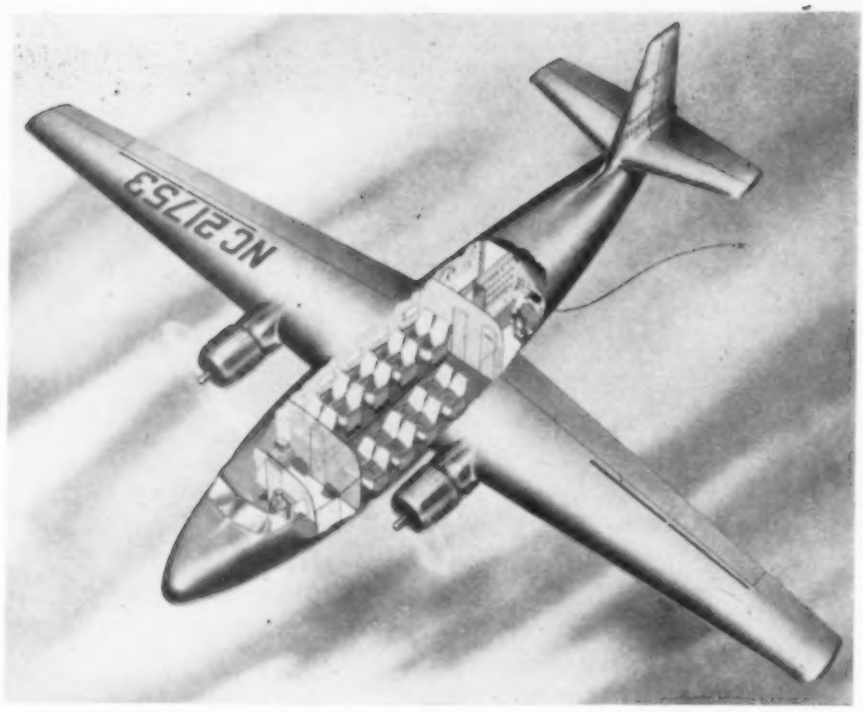


COMBINATION PASSENGER AND PARCEL PICKUP facilities feature Hughes Aircraft Company's new Feederliner revealed last month. Wide fuselage allows four-abreast seating. Twin 825-hp. Pratt & Whitney engines provide 186-mph. cruising speed for the tricycle, high-wing design.

Hughes Announces 18-Passenger Feederliner

By E. H. PICKERING

Into the expanding field of aircraft manufacturers who are planning the production of aircraft for use by feeder airlines, Hughes Aircraft Company has announced a "Feederliner" aimed at securing a share of the 350 planes of this type that H. McL. Fenwick, general sales manager, believes will be needed immediately after the war.

In general appearance this new plane closely resembles previously announced designs, as well as the specifications drawn up last year by the Feeder Airlines Association. It is a high wing, two-engine plane with tricycle landing gear, a design gross of 18,500 lbs., an anticipated 6,000 lb. useful load, normal-power cruising speed of 186 miles per hour, two 825 hp. Pratt & Whitney engines. One of the outstanding anticipated features is a stalling speed of 57½ miles per hour, which should permit safe operating in and out of small fields. A 6,000 lb. useful load is planned to permit carrying of eighteen passengers and 350 lbs. of cargo, and can be readily adapted to include pick-up gear for mail and cargo. A feature of the plane is its fuselage width, which permits four seats abreast.

Comparison of this plane with others previously announced and with existing models is shown in the accompanying table.

Trend for Feeders Developed in Texas-Oklahoma Testimony

Testimony by over thirty Texas-Oklahoma applicants before CAB Examiner Thomas Wrenn last month in Fort Worth developed several interesting trends toward a pattern for feeder air service. Examiner Wrenn said it will probably require several months for preparation of his report to the Board, and observers agreed it might be about six months before Board action is taken.

Notable suggestions included those voiced by R. C. Bowen, veteran Texas bus operator who originated, controlled or owned over 100 bus companies hauling 72,000 passengers daily before selling off his bus interests to become a feeder airline applicant, and by Oliver L. Parks, the well-known Midwestern school and aircraft service operator.

Asked what effect on bus travel short-haul air transport would have, Bowen said 50 per cent of the people who ride intercity busses would never become airline prospects over the same routes, and the short-haul airlines probably could "take" as much as 70 per cent of the remaining business—if they operate on the same frequency. He said bus ticket sales at four small Texas towns in October, 1940, showed that 77 per cent of the intercity riders traveled less than 100 miles by bus while 23 per cent traveled over 100 miles. Trip reports from drivers show 59 per cent of intercity bus riders travel under sixty miles while 41 per cent travel over sixty miles. Bowen recommended "skip-stop" service to avoid delays on the ground, with alternating towns served by different schedules, and believes eight to ten schedules daily will be necessary to compete with short-haul bus travel.

Parks pictured short-haul air transports as operating most efficiently at only 500 to 1,000 feet above the terrain, and expects hourly service will have to be provided ultimately, with more flights at night than in daytime. Trunk lines should give up small towns to the feeders, he believes, because feeders will require such stops to generate their full potential, which will profit the trunk lines sufficiently to encourage their co-operation. As for small-town airport needs, he believes nearly every town has "a patch of ground" suited for feeder operations, and as for lighting, he is willing to provide the installations in an arrangement whereby the towns could reimburse him, the average cost being about $750 per installation.

8,345 Miles Added to U. S. Routes in '44

The 8,345 miles of new routes awarded to domestic airlines during 1944 was an increase of about 15½ per cent in the total airline mileage, which at year's end stood at 62,937 miles. Thirteen carriers and twenty-four routes benefited from the extensions. Longest new route was Northwest's 1,035-mile extension from Milwaukee into New York to form a fourth transcontinental carrier. Others affected: National 870, Western 843, American 675 and 626, Chicago & Southern 692, United 570, Northeast 404, TWA 511, PCA 247 and 320, Braniff 476, Eastern 184 and 198. Short additions were also granted All American and Continental. In January of this year Mid-Continent received 584 on the New Orleans-Tulsa route. Judging from present CAB activity, additions for 1945 should exceed those of last year by a substantial margin with several new carriers entering the picture.

COMPARATIVE FIGURES FOR FEEDER LINE PLANES

	Pounds Gross Weight	Pounds Useful Load	Per Cent of gross Load Useful	Span	Length	Sq. Ft. Wing Area	Total T. O. Power	Cruising Speed at 60% Power*	Ft. Per Min. Climb S. L.	Stalling Speed	Passenger Load
POSTWAR MODELS											
Hughes Feederliner	18,500	6,000	32%	86′ 9″	65′ 9″	820	1,650	186	1,290	57.5	18
Lockheed Saturn	13,500	4,270	31%	74′	49′ 9″	.....	1,050	208	1,230	73	14
Douglas Skybus	17,300	6,620	38%	86′ 7″	57′ 2″	750	1,400	189	.....	65	24
Martin 202-12	32,500	10,658	33%	.....	.....	740	3,800	250	.....	.....	18-22
PREWAR MODELS											
Douglas DC-3	25,500	8,350	33%	95′	64′ 6″	987	2,100	185	1,170	67	21-25
Douglas DC-2	18,560	6,260	33%	85′	62′	939	1,750	174	.....	65	14
Lockheed Lodestar	18,500	6,662	36%	64′ 6″	49′ 10″	551	2,400	248	.....	70	14
Lockheed Electra	10,500	4,050	38%	55′	38′ 7″	458	900	190	.....	60	10
Beechcraft 18-S	7,500	2,475	33%	47′ 8″	34′ 3″	347	900	194	1,850	61	6
Bellanca Airbus	11,400	4,000	35%	.....	.....	.....	750	160	.....	.....	12

*At 5,000-10,000 ft. altitude.

CAA Completes New Advisory Committee for Non-scheduled Aviation

Completion of an advisory committee on non-scheduled flying, created to assist the Civil Aeronautics Administration's planning of future policy, was announced March 2 by CAA Administrator T. P. Wright, who said the group's first meeting will be held March 22-23 in Washington, D. C.

Appointed to the important committee, viewed as one of the most important steps yet taken preparatory to postwar aviation expansion, were the following: Manufacturers, W. T. Piper; airlines, John Groves, Air Transport Association; consumers, Arthur Boreman, Des Moines publisher and private pilot; fixed-base operators, Beverly E. Howard, prominent Southeastern operator; state organizations, Joe Bergin, Utah aeronautics commissioner; and private flying: Region 1, Fred Weick, chief engineer, Engineering and Research Corporation, Riverdale, Md.; Region 2, Harry Playford, St. Petersburg, Fla., banker and private pilot; Region 3, William A. Mara, vice president of Bendix Aviation; Region 4, Ed Garbacz, Little Rock fixed-base operator; Region 5, James C. Johnson, Springfield, Missouri, operator; Region 6, Douglas Robinson, Tucson distributor, and Region 7, Ed Williamson, Seattle sportsman pilot and bearing manufacturer. Federal aviation officials who had already been appointed to the committee are John H. Geisse, assistant to the CAA administrator for personal flying; Jesse Lankford, CAB safety bureau director; Fred Lanter, CAA safety regulation director, and W. L. (Jack) Nelson of CAA, who serves as executive secretary.

Creation of the committee, completed only after exhaustive study of nominations from all sections of the country, opens the door to the CAA administrator's office for all non-scheduled and private flying interests. It will meet at least once every three months to advise Administrator Wright.

Many States Operating High School Flight Experience Courses

Chairman W. P. McDonald has announced the Tennessee Bureau of Aeronautics is financing flight experience for aeronautical students in fifty Tennessee high schools. The Tennessee Flight Operators Association is co-operating in the program and the student pays part of the cost.

According to a Civil Aeronautics Administration survey, high school aviation education in other states is showing much progress. Over 200 Wisconsin high school students obtained flight experience during the term just ended, and about 660 Wisconsin students are currently receiving flight experience. In Pennsylvania a committee on aviation education has planned a program of ten lessons supplementing high school class instruction and including flight experience, principals of aeronautics and familiarization. A twenty thousand dollar flight experience program is in operation in New York state.

Director Edgar Fuller of the Civil Aeronautics Administration education service reports a growing realization that public school aviation is here to stay. Aviation courses are being taught in over fourteen thousand high schools, according to an analysis by Ernest R. Breech, President of Bendix Aviation Corporation.

Non-scheduled Hearing Develops Opposition to Economic Regulations

Any attempt at economic regulation of non-scheduled aviation will be vigorously opposed at the Civil Aeronautics Board's special hearing on March 27 in Washington. Leading the opposition are the National Aviation Trades Association, the Joint Legislative Committee and the CAA's new Advisory Committee on Non-scheduled Flying.

Regulation of non-scheduled charter flying is being studied by CAB in preparation for postwar expansion of operations. Beneficial safety regulations are generally favored by the operators. The prospect of economic regulations has developed in view of the commercial airlines' position. Certificated to operate charter trips, the carriers found that a profitable business before the war and now fear unregulated competition from individuals who might obtain and operate large transports after the war.

CAA Funds Sought for Radar Project

Start of development work with radar for civil aviation last month awaited Congressional action on appropriations recommended by the Bureau of the Budget. CAA funds involved included $42,000 for radar work, $110,000 for operations at the standardization center in Houston, $23,000 for clerks and equipment necessary to issue pilot licenses to military pilots and $84,000 for Federal Airways Service.

NATA Objectives Listed at Governor's Meeting

At a meeting of the National Aviation Trades Association's board of governors in Washington during February, plans were outlined for work on immediate NATA objectives including continued efforts to (1) keep non-scheduled aviation free from restrictive regulations, both state and national; (2) keep civil flight training "in the hands of commercial operators" but co-ordinated with educational institutions; (3) fit or revise policies governing disposal of surplus war materials, in all aviation categories, to accord with good business practices for the conservation of non-scheduled aviation as an unofficial national defense reserve; (4) advancement of aeronautics in general to supply largest possible opportunity for returning veterans, and (5) improve non-scheduled aviation standards.

President Roscoe Turner said henceforth "aircraft service operator" will be the NATA-accepted term for "fixed-base operator," which term is no longer "official." The board of governors accepted the resignation of John Wilson, executive director for the last one and one-half years, effective March 15. C. R. Mooney will act as director until a successor is named.

MAGIC AIR POSITION INDICATOR developed by Bendix for B-29 operations automatically computes navigational data to give continuous latitude and longitude readings, making calculations which ordinarily would require hours of work with charts, reference books, sextants a chronometer, and parallel rules and dividers, and eliminating complicated mathematics. It is only about the size of a quart milk bottle.

Relaxation of Physical Exams Sought by Pilot-Mechanics Group

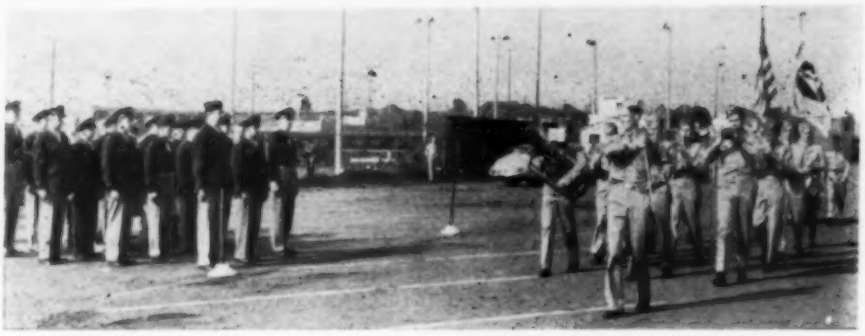
The United Pilots and Mechanics Association, after surveying conditions in forty-eight states, says over 64 per cent of the pilots, mechanics, fixed-base operators and airport managers answering its questionnaire considered present physical requirements for a private pilot license too rigid. Over 67 per cent said physical examinations should be given by any reputable licensed physician instead of CAA-designated doctors, and replies from pilot physicians or doctors otherwise connected with private flying indicated that 60 per cent of them favored relaxation of physical standards.

ADMA-NATA Discuss Convention Planning

Officers and Convention Committees of the Aviation Distributors and Manufacturers Association and the National Aviation Trades Association met last month in Cleveland to discuss plans for future conventions and exhibits similar to the one held at St. Louis last December. No definite plans for the next convention were released. Representing ADMA at the conference were R. V. Trader, Pittsburgh; Richard N. Bomberger, Lititz, Pa.; Ray Snyder, Chicago; H. P. Ladds, Cleveland; T. G. Tynan, George A. Fernley, Thomas A. Fernley, Jr., Philadelphia; E. T. Syvertsen, Cleveland; C. L. Corwin, Toledo; H. W. Draughon, Robertson, Mo.; and Arthur S. Brown, Lancaster, N. Y. Representing NATA were Roscoe Turner, Indianapolis; Clarence R. Mooney, Kansas City, Mo.; and Howard T. Ailor, New York.

Dallas Show Cancelled

The Pan American Aircraft Exposition scheduled for May 20-27 in Dallas will not be held this year because of the ODT directive forbidding conventions having an attendance of over fifty persons. However, Secretary J. Ben Critz has advised exhibitors and others interested in the exposition that it will be made a permanent affair as soon as war conditions permit.



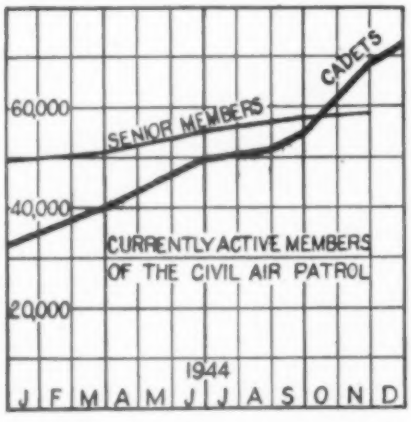
CIVIL AIR PATROL CADET BAND, Oakland Squadron, Oakland, California, with its leader and organizer, sixteen-year-old Cadet Sgt. George Dowling, pass in review before officers of the Army Air Forces and Civil Air Patrol. Capt William O'Neill, chief training liaison officer of the Ninth Service Command is the reviewing officer. This band is believed to be the only official CAP cadet band in the United States.

Drive for 250,000 Cadet Strength Gains; State Quotas Listed

Quotas for each Wing in the drive to increase Civil Air Patrol Cadet membership to 250,000 members have been assigned, and the Civil Air Patrol League says the goal will be met during 1945 if the Cadet program's recent rate of growth continues.

Mobilizing 250,000 Cadets out of the 130-odd million people in the country means about 2,000 per million of population, or about two-tenths of one per cent of the population of a given area. To allow for incomplete results in some regions, each CAP unit has been asked to plan for a Cadet corps numbering about three-tenths of one per cent of the unit area population, or 3,000 per million. Some already have met or exceeded their quotas, with the Wings led by New Hampshire and Rhode Island.

"Our Air Forces, now the mightiest in the world, will be over-age in a few years unless young recruits keep coming in," CAP League Headquarters pointed out last month in the first issue of its newspaper. "Whether or not AAF recruiting is resumed during the war, the CAP Cadet Corps can play a vital role



in bringing a steady peacetime volume of recruits into the Air Corps Reserve and into the AAF itself year after year, as a safeguard against being caught in another Pearl Harbor."

State quotas are as follows: Alabama 3,900, Arizona 900, Arkansas 3,100, California 14,000, Colorado 2,400, Connecticut 3,500, Delaware 500, Florida 2,900, Georgia 4,300, Idaho 1,100, Illinois 15,800, Indiana 7,000, Iowa 5,300, Kansas 3,700, Kentucky 5,600, Louisiana 3,200, Maine 1,800, Maryland 4,200, Massachusetts 8,700, Michigan 11,000, Minnesota 6,000, Mississippi 2,300, Missouri 7,400, Montana 1,200, Nebraska 2,800, Nevada 250, New Hampshire 1,000, New Jersey 8,200, New Mexico 1,100, New York 27,000, North Carolina 5,400, North Dakota 1,400, Ohio 13,400, Oklahoma 4,500, Oregon 2,300, Pennsylvania 20,000, Rhode Island 1,400, South Carolina 2,300, South Dakota 1,300, Tennessee 5,000, Texas 12,000, Utah 1,100, Vermont 750, Virginia 4,300, Washington 3,700, West Virginia 3,800, Wisconsin 6,700, Wyoming 500.

ODT Allows Two CAP Conferences in February

The recruiting conference of the Iowa Wing, CAP, at Des Moines, and the recruiting conference of the Nebraska Wing, CAP, at Omaha, were two of the fifteen meetings allowed for the first part of February by the War Committee on Conventions. Four hundred sixty-nine applications were denied by the ODT.

Cadet Funds Pay N. C. Air Marking Costs

The North Carolina Wing has begun a state-wide air marking program, employing a painter recommended by the CAA. One area is air-marked at a time, and CAP cadets are collecting contributions from local merchants to pay the painter.

New Taylorcraft, 'copter Shown at Florida CAP Show

Taylorcraft's new 125-hp., 4-passenger model, a 100-hp. conventional Cub Cruiser and an Aeronca K were displayed last month at a Civil Air Patrol recruiting show held by the Florida Wing, commanded by Major Zack Mosley. Another event was a demonstration by the Coast Guard of a Sikorsky helicopter. MacDonald Goodwin of Taylorcraft flew the new family plane to Florida for the showing and reported excellent performance all the way.

Five Colorado Wing Members Lost on Duty

Five members of the Colorado Wing, Civil Air Patrol, have been killed in active duty assignments. The five men are Second Lt. Harry M. Maugham, Capt. William L. Schuth, Second Lt. George W. Darling, Second Lt. Ben Berger and Staff Sgt. Keith A. Clasby. Tribute was paid to them recently by the Wing publication.

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7. Determination of true altitude above sea level.
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The log sheet portion of the X-C is designed primarily for the pilot, who must devote most of his attention to flying and who must keep his navigation log as simple as possible. The log sheet is for keeping in orderly fashion that data essential for cross-country navigation, so that it need not be committed to memory or scrawled illegibly on a chart.

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BOOK REVIEWS

Intermediate Aerodynamics, *by Robert Wesley Truitt, published by Pitman Publishing Corporation, 2 West 45th St., New York City, price,* $3.75.

The aeronautical engineering student will find here an original presentation of the important facts and theories for the accurate application of aerodynamics. Included are descriptive material and mathematical explanations for practical problems relating to the Airfoil, Drags, Stability, Load Factors, Propellers, Slots and Flaps.

Airframe Materials, *by F. S. Stewart, published by The McGraw-Hill Book Company,* 330 *West* 42nd St., *New York City, price* $2.50.

In this introductory textbook the author discusses the mechanics of materials and gives an account of the processes used to assemble the lightweight materials of which airframes are constructed. Special attention has been given to the latest advances in the field.

The Proceedings of the 1944 National Aviation Clinic, *held in Oklahoma City, November* 15-18, *published by Harlow Publishing Corporation, Oklahoma City* 2, *Okla., price* $2.50 *postpaid.*

An index digest features this issue, arranged by subject matter, with reference to all places in the proceedings wherein any particular subject is referred to.

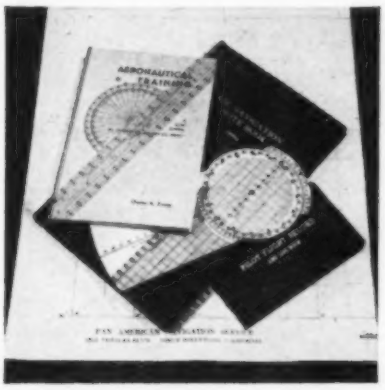
Those desiring copies should place their orders with the publishers at once. A limited number of last year's proceedings are still available at $2.50 each.

NEW LITERATURE

The Princeton Film Center, *Princeton, N. J.,* has just released its 1945 Film Catalog. The Aviation section contains a comprehensive list of interesting and instructional films showing the origin, development, and performance of various types of bombers, fighters and training planes, as well as official Army and Navy Pre-flight instruction and training subjects. Copies may be obtained free on request.

Switlik Parachute Company, *Trenton 7, N. J.,* has issued a new manual in colors containing information regarding the types of parachutes manufactured, the methods of packing a Switlik parachute and other data concerning its use. The manual will be sent free to anyone writing the company.

Pesco Products Co., 11610 *Euclid Ave., Cleveland 6, Ohio,* has announced that copies of its new descriptive folder on the Pesco "Univac" Brake Intensifier for Aircraft will be sent to interested readers upon request.



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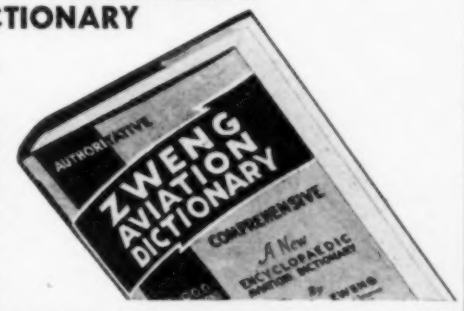

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By TONY HAGMANN

Dallas, Texas—Because there is about a half pound of Spring in the air, our thoughts turn to the more facetious things in life and if yours do too, check the doll department at Love Field which is worthy of a baker's dozen of orchids . . . or March Marigolds, if March ever saw a Marigold. For example, step into the Priority Office. Beatrice Barton, who DID NOT give any "A" to any dog, she said with spirit, will box a cup of coffee with the right people if properly invited . . . a worthy cause.

Or check the cute chicks, Willa Caviness and Blanche Gates, who sell SOUTHERN FLIGHT and the "makin's" from Lorraine Sanders' corner. Two nicer dolls cannot be found if you are looking for smiles and service. Very Grade A. Is this giving you Spring fever? Well go up to Hart Bowman's office. There you will find Jane Barnett who will help you think of the better things in life. Or step over to CAA and find Harriett Orm. She is the most girl you could find weighing about 86 pounds. And of course there is the usual Texas quality of feminine beauty in all the airline ticket booths. All this from a gal (me) should mean something.

Hot tip number two concerned watches and chronographs. If you don't want to be late for that date, take your chronograph over to Cooper's Instrument Repair Shop. There it will receive the careful attention of "Mac" McAfee who is an old hand at all the dials, numbers and hands on the thing. He will give you the 24-hour dial, if you ask for it. By the way, you don't have to wait one hundred years to get it back, so don't give the claim check to your grandson for his twenty-first birthday gift.

Now, just in case you think Texas is all spit and polish, we will tell you of one Walter Johnson. Known as "Wildcat" Johnson, a name he picked up in college, our friend shuffles an Aeronca Chief over the country side, calling on the trade interested in purchasing books from the J. B. Lippincott Publishing Co. Nothing too unusual about that, for Texas has many flying people who have a hen of a lot of ground to push in back of them in order to get to the next port of interest, but "Wildcat" is an experienced hand at herding buffalo. Yep, 250 of the "hump on the neck" creatures used to hit the trail at the drop of his voice out in West Texas. He finds the Aeronca a bit more modern. Sure, he'll spin yarns with you about the Old West, if you bait him with a pack of cigarettes. But don't peg him for a dude because he dresses business-like, or you'll think you hit an updraft. Nice fellow to meet, and you'll find him at Mustang Airport.

"Wildcat" Johnson

Speaking of Mustang, reminds us: A twin-engine Beech, Standard Oil, Ohio, flown by Harvey Sievers, brought C. H. Metz and G. W. Hanneken down to see Texas. They said "never have seen a bluer sky or such warm winter weather" . . . We've got something, danged if we ain't.

By counting on both hands and our left foot, we have found there are now fifteen airports in Dallas, ready or just before being ready for action. This includes White Rock, Hudson, Mustang, Love Field, March, Clearview, Victory, Lou Foote, Sky Ranch, 2nd Ave., Red Bird, Davis, Dallas Skyline, Lake

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June and Dallas Airport. The last one is the happy idea of Fred Nagle and Charlie Orr. They found a plot of ground one and one-half miles from Guiberson's Forest Avenue plant. It is fifteen minutes from the Liberty State Bank, if you want a silver dollar (they have the cokes), and has 2,600 feet of runway getting fixed for business. There are no telephone poles or high lines for markers, so sayeth the boys. What is the airport world coming to?

Other than the fact a P-38 tried to knock Southwest Airmotive's test stand into the ground a little deeper last month, which we think is an odd way to get your name in the paper and a system we wouldn't recommend, there hasn't been much listed on the blackboard in the column marked "interesting things to do today". However, the pay-off is that two more planes tried to pat the dirt with a wing and got all crumpled up, proving that things do happen in three's. Everybody walked away, some a little faster than others, but the count resulted in all being safe on second.

We will leave you this month with a burning question: If there are no cigarettes, where do all the cigarette butts come from?

Bye now.

Fort Worth, Texas—*On Tour with Tony*—We cruised over the Mid-West via one popcorn popper with four cylinders, and threw out the anchor at the fence line to call on Ruth Taylor and spin a few yarns . . . but chatted instead with Mrs. McAllister who was holding down the field. We decided individual hangars were nice and personal and people like 'em.

Thence to the Texas Hotel where the CAB was holding forth to listen in on some of the feeder route applications. John A. Cook was up for Lone Star Airways, San Antonio, and talking about Lockheed's new Saturn. He said Lone Star would use them. The Gulf Airways, SA, too, came to bat with Dr. John Frederick 'lowing he was speaking for Jack Neals' deal . . . Gulf would like to operate 'round and 'bout too. Questions and answers in law talk seemed to be the order of the day, so we wiped off our pencil and went for the wide open spaces. However, not before we met Lt. Wayne B. Lee.

Lt. Lee had about nine pages of application (these usually run into ninety-nine pages and ten thousand dollars' worth of stuff) which he presented. He wants to fly freight, passengers and mail out of Perryton, Canadian, Spearman, Borger or Amarillo, Texas, and Liberal, Kansas. Panhandle, strictly. The Lieutenant is a real old man, in his early twenties

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MEET THE VOICE BEHIND THE MIKE: Chief Aircraft Communicators, CAA 4th Region, are shown above at a recent meeting in Fort Worth. Left to right, front row, they are: B. K. Twyeffort, El Morro, N. M.; G. D. Estes, Laredo, Texas; W. R. Rogers, Gage, Okla.; R. T. Richards, Little Rock, Ark.; A. V. Guynes, Palacios, Texas; J. B. Hendricks, Yoakum, Texas; R. L. Cathey, El Paso, Texas; F. C. Van Hook, Lake Charles, La.; C. L. McCormick, Oklahoma City, Okla.; E. G. Igo, Ponca City, Okla. Second row: L. S. Falcon, Lafayette, La.; S. C. Barclay, Waco, Texas; G. R. Williams, Otto, N. M.; L. H. Land, Salt Flat, Texas; B. L. Hurst, Clarendon, Texas; K. C. Christeson, Anton Chico, N. M.; R. C. Metcalf, Texarkana, Texas; L. C. John, Navasota, Texas; R. W. Robbins, Big Spring, Texas; D. S. O'Neill, Brownsville, Texas; P. B. LeFlore, Sulphur Springs, Texas. Third row: D. M. Bussey, Ardmore, Okla.; W. D. Ditmore, Las Vegas, N. M.; W. C. Bettis, Wichita Falls, Texas; A. D. Rosser, Guadalupe Pass, Texas; H. J. Fohn, Austin, Texas; V. A. Jones, Shreveport, La.; J. F. Donahoe, Amarillo, Texas; M. K. Lawson, Galveston, Texas; J. L. A. Carroll, Columbus, N. M.; M. P. Goldberg, Albuquerque, N. M.; C. S. Loving, Gainesville, Texas; J. E. Parmley, Rodeo, N. M.; E. A. Riefenberg, Corpus Christi, Texas; C. P. Fry, Alice, Texas; M. L. Braden, Dallas, Texas; C. L. Selby, Fort Worth, Texas; J. B. Swint, Engle N. M. Back row: G. N. Rang, Tulsa, Okla.; G. R. Jordan, Harpersville, Texas; P. W. Connally, Acomita, N. M.; P. F. Lanman, San Antonio, Texas; J. R. Shadden, Socorro, N. M.; W. L. Norton, Houston, Texas; C. M. Martin, Abilene, Texas; Jack Hover, Monroe, La.; G. J. Guillott, Beaumont, Texas; L. C. Elliott, Regional Manager; G. L. Rand, chief, communications branch; A. F. Pittius, Santa Fe, N. M.; H. W. Logan, Tucumcari, N. M.

we'd guess, and got the idea from an article in *Readers' Digest* about "Be Your Own Boss." It is his answer to what he's planning to do after the war. Reckon lots of boys overseas might want to do something like this?

Our jeep was 'bout to run out of water about this time, so we didn't get to call on our coffee and coke pals at Meacham or Globe, like the flying Les Bowmans, or Gene Royer, who is now vice president of Interstate Credit Corp. . . . or Eddie Jackson who has promised us a ride in the newest Swift . . . (we ain't seen it yet) . . . this is a promise we will collect. Bye now.

TONY.

Kansas City, Missouri — *by Marion Melcher.* Among the visiting airmen during this forepart of 1945 was L. Welch Pogue, chairman of the Civil Aeronautics Board, who spoke at a luncheon sponsored by the Council on World Affairs. Pogue's address covered a discussion of events leading to and taking place at the civil aviation conference held in Chicago recently. . . . Pilots and weather men flew here too, revealing how pilots are taught to make weather work for them during the sessions of the American Meteorological Society convened in Kansas City.

The first national board meeting of the newly elected officers of the Women's National Aeronautical Association met in Kansas City. Among the visitors were President Gladys Dallimore of Pueblo, Colorado; Board Member Mrs. Al Guthrie of Stillwater, Oklahoma; Unit Presidents Mrs. Frank J. Eastman of Cheyenne, Wyoming, and Mrs. Etta Kushner of Topeka, Kansas. Kansas City unit members attending the discussion meeting included Neva Rea, Esther Wirthman, Eunice Mecaskey, Emily Watson, Cay Aber, and your reporter, for that's how I know about it.

Birmingham, Alabama — *by Edith Wideman.* Aviation activities hereabouts have literally been spinning of late. Out of the stimulating whirl has come to Aero Club members a speech by ex-Congressman John Newsome on the "Airfields of the European Theatre", he recently toured.

The State Aviation Commission met with the Legislative Interim Committee on Aviation (members of this committee were honor guests of the Aero Club on Brewer Trophy Day) to discuss state legislation to be presented at the next legislative session . . . The commission had as its expert witnesses Ed Nilson of Beechcraft and Bill Anderson, state of Pennsylvania. Ed stopped over in Birmingham to meet Carl Wooten and Bill Beaufort of Beech. It was good seeing them all again.

Other enjoyable visitors of late were Bob Pitts, head of Aeronautical Department at Auburn with J. E. Hannum, dean of Engineering at API . . . Frances Peacock has taken leave from the airport and Blanche Bentley is holding down the port for Steadham Acker until Frances returns. . . . Steadham continues to take an active part in the national and local picture of aviation, particularly in postwar planning; much of this takes him out of the city on important conferences and aviation meetings.

The City Aviation Planning Board in formulating its recommendations assembled with representatives of aviation interest in BH and requested suggestions. Delta was represented by Ed Bishop and Tim O'Shea; Eastern by

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Katherine Sigler and Johnnie Daniels; PCA by Vance Tomlin; CAA by D. K. Hudson; from the control tower and weather bureau came Clyde Lancaster and Charlie Bradley, respectively; Southern Airways was represented by Frank W. Hulse, H. A. Strickland and Watson Eaddy.

To add to wartime schedules, Eastern and Delta have added new flights in and out of the city; Eastern has put on an additional southbound flight out of Birmingham to Mobile and NO, connecting there for deah ole Houston . . . also an additional northbound flight to New York. Delta has a new afternoon flight to Fort Worth to which Mary Grider was transferred; Alice Watson was promoted to Mary's place as Chief Reservationist. Delta boasts of new and beautiful additions to the CTO. They are Jacqueline Barr, Katherine Boles, Virginia Oglesby and Martha Golur. Mary Louise Moore, traffic secretary, has joined the realms of the married. Vivian Adams has been promoted to chief ticket agent.

And who says families won't fly—students at Southern Airways dispute this theory: Joe Burnett and Son Junior have just soloed and are already arguing over who will have the family plane first; M. D. Baggett and his Junior have a bet up over who will solo the quickest; Joe and Bernice Reznik are on their way toward private licenses. C. E. Dodd, CAA educational consultant, and a Texan, no less, called on the educators of the city and state of late. We decided he should be called Aviation Education Enthusiast. We understand Carroll Cone is headed this way to tell us some of Pan American's plans as they affect BH. There's a great day coming, come April, so watch for your SOUTHERN FLIGHT.

Phoenix, Arizona—*Marjy Hardman*—The Phoenix Parachute Club, operating as a unit of the Phoenix Squadron of the Civil Air Patrol, is staging a series of training jumps at the Thunderbird No. 2 Auxiliary Field near Cactus, Arizona. The object is to determine the length of time it would take the jumper to reach an injured person on the ground. Warrant Officer David Gold, who holds the only master 'chute rigger license in the state of Arizona, made the simulated rescue in two minutes and twenty-seven seconds. Warren Smith, who, incidentally, is the chief rigger at Thunderbird Field No. 1, made his first training jump.

As for being a field day for training jumps, there was a ten to fifteen mile an hour wind in the upper air and practically no wind on the surface, making Dave's jump a little more difficult because of the drift. (Note to residents of West Texas: Arizonians aren't used to wind!) The jumps attracted quite a crowd, including members of the Civil Air Patrol, Cactus residents, and flight inspectors of the Phoenix office of the Civil Aeronautics Administration. Wing Commander Frank Beer was a spectator.

BREWER TROPHIES were awarded in Birmingham last month by Frank G. Brewer (left, above). Others in the photo, left to right, are CAP Major H. S. Barton, who received a trophy awarded the Alabama Wing; Congressman Jennings Randolph, speaker; Dr. John R. Patty of Howard College, who received a trophy for outstanding air youth work, and Steadham Acker.

Carl Knier, of the Sky Harbor Air Service, toured the state of Texas with some local ranchers trying to buy some purebred Hereford breeding stock. Mike Mitchell spent a week in Los Angeles taking his airline written examinations. Maggie Webb passed her written for flight instruction. Rose Terzian actually found time to stay home long enough to take her commercial. The local office of the CAA has been quite busy recently—seems that word has reached the Army boys that commercial licenses are being dished out to the service pilots who are on active duty status. Mary Lewis was flying charter trip to Globe, when on return trip the old plane blew a barrel near Florence Junction. She and her passengers were quite thankful for the landing strip there. They made it!

Elwood McJunken, pilot, and Harrison Duff, Jr., observer, spotted a B-25 on a recent search and rescue mission of the Civil Air Patrol. It was a hard ship to locate as it was on a mountain and all of it covered with snow except one small part. (Sho' am definite—huh!) Anyway, they richly deserve a pat on the back.

Membership cards in the CAP have been received for Joy McIlwain, George Bastian, Mary Ann Lanane, Billie Zeh, Maury Wilson, and Simon Chilleen.

Art Bethancourt is now with the Intercontinental Division of TWA, based at Washington, D. C. His wife, Bess Bethancourt, instructor at Southwest Airways, plans to join him in the near future. Instrument ratings, taken on Fairchild 24's at Southwest, were received by Tom Fisher, Richard Belew, John Caywood, Lloyd Norris, Joseph Miller and L. S. McLain.

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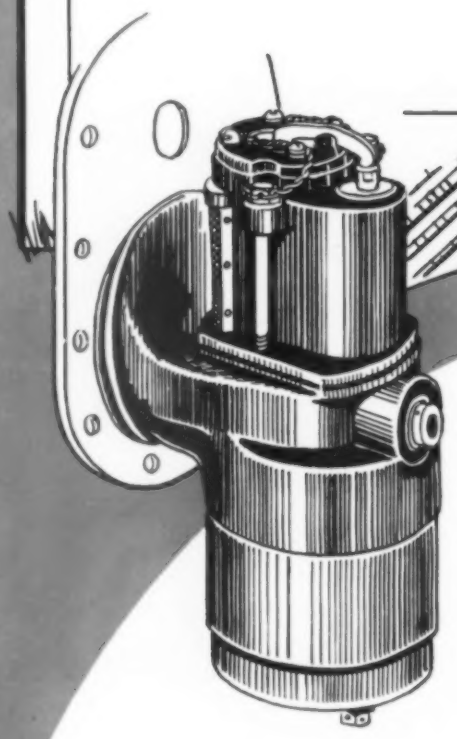

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